POLICY RESEARCH WORKING PAPER 2377

Reforming the Water Supply in Abidjan, Côte d'Ivoire

Mild Reform in a Turbulent Environment

Claude Ménard
George Clarke

The success of Abidjan's water sector is attributable to the government's consistent support for private sector participation in the sector and to the institutions that have guaranteed the private operator's property rights. Strong institutions with adequate human capital allow the government to supervise the private operator and monitor the contractual arrangement well, at least by regional standards.

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Summary findings

Compared with other urban water systems in West Africa, the water supply system in Abidjan performs very well. Documenting the recent history of that system, Ménard and Clarke try to answer three questions: What motivated reform in a system that was already performing well? How and why did the reform affect sector performance, and what additional changes might improve performance further? And what explains the relatively strong performance of Abidjan's water system? Is the success attributable primarily to an efficient contractual arrangement or more generally to Côte d'Ivoire's institutional environment?

In a region plagued by political instability, Ivoirian political institutions were remarkably stable for close to 40 years. In part, the success of the Ivoirian model is the result of these institutions' stability and credibility.

The single-party system in place at the time of reform might suggest that there were few restraints in place to prevent the government from behaving opportunistically. But several features of the institutional environment protected against such opportunism. Because of this, and because reform was based on a system already performing well, the contractual arrangement with a private operator proved exceptionally capable of adjusting even in the face of dramatic changes in the external environment.

Institutional environments are not as favorable in other countries in the region, so similar contractual arrangements might be less successful elsewhere.

Reform in Côte d'Ivoire was motivated primarily by a macroeconomic crisis, which reduced the resources available for public investment. Without either a sector crisis or a realignment of political forces, the will for reform was weak. Consequently, opportunities for improvement were missed and some problems remain.

Among other ways in which the system could be improved: Splitting the water system into autonomous subsystems for different cities, and allowing bidding for investment contracts, would increase the chances of competition for investment, which does not currently exist.

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I Introduction

Especially when compared to other urban water systems in West Africa, the water supply system in Abidjan performs very well. For over thirty years, despite rapid population growth, there has been enough investment to cover basic needs and, consequently, coverage is good by regional standards. Prices, although high compared to countries in Latin America and Asia, are lower than in many neighboring African countries and have been declining in real terms.[1] The strong commercial performance of the operator in Abidjan has produced sufficient revenue to subsidize the expansion and development of urban water systems throughout the country. Further, the stable contractual arrangement between the government and the private operator, SODECI, has proven adaptable enough to survive several adjustments and crises. All stakeholders—private users, government officials, international organizations and the private operator—agree, with few reservations, that the arrangement has worked well. Consequently, the model has been imitated throughout Africa and other regions of the World, although the results have sometimes been more mixed than they have been in Côte d'Ivoire.[2]

This paper documents the recent history of the water system in Abidjan, focusing on the latest reform to the contractual arrangement in 1988. We focus on three main questions: (1) What motivated reform in a system that was already performing well? (2) How, and why, did the reform affect sector performance and what additional changes might improve performance further? (3) What explains the relatively strong performance of Abidjan's water system—is the success primarily due to an efficient contractual arrangement or is it due to more general characteristics of the institutional environment in Côte d'Ivoire? Given that the Ivoirian model is being transplanted to other countries, understanding the reasons for its strong performance will allow us to anticipate the likely benefits and limitations of the arrangement in other developing countries.

The primary motivation for reform was a macroeconomic crisis, which reduced the budgetary resources available for public investment. This made it difficult for the government agencies responsible for investment to increase system capacity fast enough to serve the city's rapidly expanding population. However, the crisis did not lead to a change in the government's support base nor did it have a dramatic impact on service quality for

[1] Ménard and Shirley (2000) compares prices in six African and Latin American countries and World Bank (1999) compares prices in Côte d'Ivoire to prices in some Asian Cities. World Bank (1999) notes that prices in Côte d'Ivoire are similar to those Asian countries where service quality is high. Ménard and Clarke (2000) shows that in the mid-1990s, prices were lower in Abidjan than in many other African countries.

[2] For example, a similar, but not identical, arrangement in Guinea, while proving to be a major improvement over the previous system where a public enterprise was responsible for operation, maintenance and investment was less successful than the arrangement in Côte d'Ivoire (see Ménard and Clarke, 2000).

existing customers and, therefore, there was little support for a major restructuring. Consequently, the crisis led to only a minor reform that shifted responsibility for investment from the government budget to sector resources and increased the private operator's responsibilities. This provides counterfactual evidence that supports one of the central hypotheses of the project: in the absence of a sector crisis or a realignment of political forces, the *desirability of reform* is weak and, therefore, reform will tend to be limited.

As the paper shows, the reform was quite successful. Most performance indicators appear to have improved or stayed the same, tariffs have fallen, and all parties to the agreement appear satisfied with system performance. Most notably, despite a drop in investment expenditures, the private operator managed to reverse a downward trend in coverage levels in Abidjan and to maintain service quality. However, the modest nature of the reform meant that some opportunities for improvement were missed and that some problems remain, calling into question the continued viability of the arrangement. The paper discusses the challenges facing the system in the near future and speculates about steps that might further improve sector performance.

Finally, the paper tries to explain the success and limitations of the contractual arrangement by looking at the interaction between specific characteristics of the institutional environment in Côte d'Ivoire and the design of the contract. Notwithstanding events at the end of 1999, in a region of the world plagued by political instability, Ivoirian political institutions have been remarkably stable for close to 40 years. In part, the success of the Ivoirian model is the result of the stability and credibility of these institutions. Although the single party system in place at the time of reform might suggest that there were few restraints that would prevent the government from behaving opportunistically, several features of the institutional environment, discussed in detail in the next section, protected against this. Because of this, and because the reform was based on a system that was already performing well, the contractual arrangement proved to have exceptional capacity to adjust even when faced with dramatic changes in the external environment. This allowed the government to maintain confidence in the system and to guarantee the safeguards protecting the private operator during the reform process, ensuring the feasibility and sustainability of reform. Because the institutional environments of most other countries in the region are not as favorable as in Côte d'Ivoire, similar contractual arrangements might be less successful when copied in these countries.

The next section of the paper (Section II) will analyze the working conditions of the water supply system in Abidjan prior to reform. In Section III, the paper describes the institutional environment in Côte d'Ivoire, while Section IV discusses the macroeconomic crisis that motivated reform and the effect that this had on the government's support base and the water sector. Section V examines the reform itself. It discusses changes

introduced in the preexisting governance structure, characteristics of the contractual arrangement adopted in 1988, and modalities of its implementation. The next section (Section VI) summarizes the effect that reform had on sector performance and the reasons for the changes. Section VII discusses difficulties to overcome and lessons that can be learned from the Abidjan case and section VIII concludes.

II A Continuing Private Sector Participation

Even before the 1988 reform, sector performance in Abidjan was impressive by regional standards. Access to potable water was very high, almost all connections were both metered and billed, and private customers routinely paid their bills. Further, piped water was drinkable and service interruptions were infrequent. In this section of the paper, we discuss sector organization and performance before reform. The success of Abidjan's water supply system supports the view that a *combination* of stable and well-defined institutional rules and an appropriately designed contract determines success.

II.1 Sector Organization before Reform

Private participation in urban water supply is a well-established tradition in Côte d'Ivoire, especially in Abidjan. A private enterprise, the *Société de Distribution d'Eau de Côte d'Ivoire* (SODECI), has been responsible for operation and maintenance of the Abidjan water system since before independence and has been responsible for operation and maintenance of all urban water systems in Côte d'Ivoire since 1974. Although its responsibilities have changed several times, its continuing presence demonstrates the feasibility of private sector participation in Côte d'Ivoire's urban water sector.

Partners and responsibilities. Until 1956, most water systems were managed by local public agencies under the supervision of city councils. Because the systems were often operated inefficiently and were in need of significant investment, some municipal governments turned to the private sector. In 1959, before Côte d'Ivoire became independent, an international tender for a concession contract to supply water in Abidjan was launched (SODECI, 1996a). A French company, SAUR, which was already active in West Africa, won the tender. However, since as a condition of the contract, the private operator had to be subject to Ivoirian laws and be majority-owned by Ivoirian shareholders, a new enterprise, SODECI, with SAUR as the main shareholder, was formed.[3] The thirty-year *concession contract* that the city government signed with SODECI made SODECI

[3] SAUR was the largest shareholder (46%), but individual Ivoirian investors owned 45% of the company and the Ivoirian government held a 5% share through a Government finance company. The remaining 4% were held by individual French investors at that time (World Bank, 1977).

responsible for operation, maintenance and investment in Abidjan (World Bank, 1977).[4] Over the next few years, SODECI signed five additional lease contracts and three additional management contracts in other municipalities in Côte d'Ivoire (SODECI, 1996a).

In 1967, SODECI's role in Abidjan was significantly reduced when responsibility for most investment was passed to the government, making the contract into a management contract with SODECI responsible for operation and maintenance of the system.[5] SODECI also continued to implement significant investment on behalf of the Ivoirian government. In 1974, SODECI's success in Abidjan encouraged the government to award SODECI a fifteen-year contract for the operation and maintenance of urban water systems in all other Ivoirian cities.[6] The government did this to improve sector performance outside of Abidjan and to equalize tariffs in urban areas. Since costs in Abidjan were considerably lower than in other areas, Abidjan ended up subsidizing urban water supply in secondary cities.

At this time, responsibility for the sector management was transferred to the central government and, from then on, local authorities played only a minor role in the sector. A government agency, the *Direction de l'Eau* (known as the *Direction Centrale de l'Hydraulique* until 1984) retained ownership of sector assets, managed and planned investment and monitored the contract with SODECI.[7] After January 1976, sector finances were managed by an autonomous agency, the *Fonds National de l'Hydraulique (FNH)* located in the *Caisse Autonome d'Amortissement (CAA)*. The FNH received part of the water tariff to service sector debt and could borrow to finance investment.

SODECI has thus been an active participant in Abidjan's water supply system for over 40 years. Indeed, no other enterprise, private or public, has been involved in the operation and maintenance of any of the urban water systems in Côte d'Ivoire since 1974. SODECI has also played a limited role in the sewerage system, although operation and maintenance of the sewerage system has never been included in the contracts for urban water supply.

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[4] At the end of the contract, the assets reverted to the government.

[5] SODECI remained responsible for renewal of electromechanical equipment for Abidjan's boreholes (World Bank, 1990, p.65).

[6] The thirty-year contract for Abidjan continued and, in addition. SODECI became responsible for the installation and maintenance of pumps in rural areas (*hydraulique villageoise*). The Ivoirian government's primary motivation for reform was its desire to promote growth outside of Abidjan by improving the standard of living in smaller cities and rural areas (World Bank, 1974, Annex 11, p.1). In addition, President Houphouët-Boigny had been impressed by both the demand for potable water and the relative efficiency of SODECI compared to the public utility, EECI (Energie Electrique de Côte d'Ivoire), which ran most other water systems in Côte d'Ivoire

[7] Since many agencies changed their names, sometimes several times, during the thirty-year period, for ease of exposition, we will refer to all agencies by their names in 1997.

II.2 Characteristics of the Water Supply System Prior to Reform

Source of Water. Almost all of Abidjan's water comes from an abundant aquifer, which should be able to supply sufficient water to satisfy demand in the medium term.[8] Although Abidjan is close to the ocean, the water is not saline because the aquifer is in the hilly northern part of the city. The aquifer is located about 60 meters underground and is protected by a thick layer of clay (World Bank, 1989, p.2) and, consequently, the water is not highly polluted.[9]

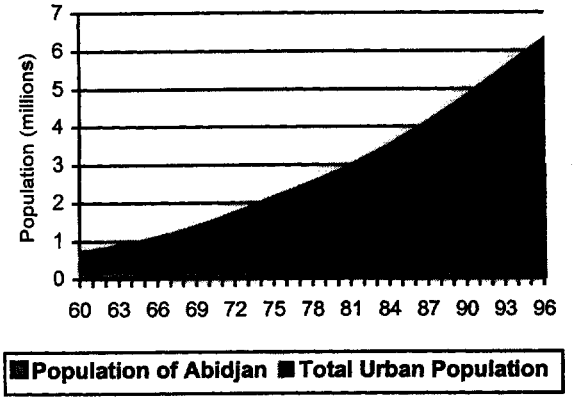

Figure 1: Urban Population in Côte d'Ivoire, 1960-1996

Source: World Bank (1998).

System expansion. Partly due to a large in-flow of immigrants from neighboring countries, the population of Abidjan grew very quickly following independence, (see Figure 1). While the population was estimated to be about 180,000 in 1960, it was estimated to be close to 3 million in 1996. Although this rapid growth put pressure on the system, the number of connections grew faster than the population for most of the 1960s and 1970s (see Figure 7) and, consequently, coverage increased. Between 1960 and 1980, the number of connections increased from 3,802 to 75,645—if an average connection serves about 13.5 people, the coverage rate in Abidjan would have been close to 80% by 1980 (see Figure 9).[10]

In large part, this was due to a very ambitious investment program. During the 1970s, annual investment averaged US$40 million (World Bank, 1993, p.10), much of it financed through government borrowing and subsidies. In addition to increasing the number of connections, this also increased water produced (see Figure 2) and water billed

[8] World Bank (1982, p. 8) notes that it is estimated that the aquifer has a safe yield of around 700,000 m^3/day.

[9] Although the aquifer had become polluted in low-lying areas, SODECI had abandoned these wells by the mid-1970s (World Bank, 1978, p. 13).

[10] SODECI officials estimated that each connection served between 12 and 15 people in 1997. Since the ratio of connections to households has not changed significantly since the 1980s, this might be a reasonable estimate for this period also.

(see Figure 6). Between 1960 and 1980, production in Abidjan grew from 8.9 billion m^3/year to 65.0 billion m^3/year and water billed grew from 5.0 billion m^3/year to 50.7 billion m^3/year.

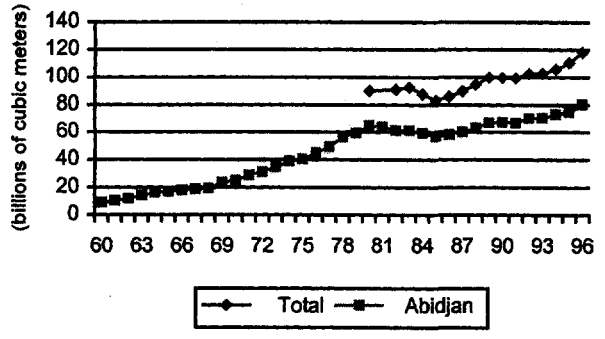

Figure 2: Water Produced (billions of cubic meters)

Source: SODECI.

Tariffs. In 1974, the tariff was CFAF 55/m^3 ($0.25/$m^3$) in Abidjan and averaged CFAF 80/m^3 ($0.36/$m^3$) elsewhere. After SODECI became responsible for water supply in all urban areas, a nationally uniform tariff of CFAF 89.5/m^3 ($0.40/$m^3$) was imposed—subsidizing water supply in secondary cities was one of the main reasons for the 1974 reform.[11] By 1979, it was estimated that nearly 30% of the tariff in Abidjan went towards subsidizing water supply in secondary cities.[12] To compensate low-income users for the higher prices, a social tariff of CFAF 60/m^3 ($0.27/$m^3$) was introduced for the first 5m^3 of consumption per month.[13] In addition, the connection fee for small, low-income, consumers was lowered and then abolished. Starting in 1976, consumers using pipes of 15mm and less did not have to pay a connection fee, other than a deposit of CFAF 6000 ($25). In 1981, tariffs were increased, with the full tariff reaching CFAF 224/m^3 ($0.78/$m^3$) and the social tariff reaching CFAF 128 ($0.45/$m^3$). This made the average tariff CFAF 205 ($0.71/$m^3$), of which CFAF 100/$m^3$ (0.35/m^3) went to SODECI, CFA 78/m^3 ($0.27/$m^3$) to the FNH and CFAF 27/m^3 ($0.09/$m^3$) to the FNA (World Bank, 1982).

Water and service quality. Although it is difficult to find exact data, it appears that service and water quality in Abidjan were good even before reform. World Bank (1982, p. 21) reports "SODECI is efficiently managed and provide first class service to its

[11] World Bank (1982) estimated the average incremental cost (AIC) of a cubic meter of water, which it used to as a measure of long-run marginal cost, for several cities in Côte d'Ivoire. The AIC in Abidjan was estimated at CFAF 104/m^3. In comparison, the average AIC in eight secondary centers was estimated to be CFAF 271/m^3. In the late 1980s, World Bank (1990) estimated that the long-run marginal cost of water was CFAF 48 ($0.13) in Abidjan and CFAF 180 ($0.51) in the rest of the country.

[12] CFAF 42/m^3 out of the CFAF 149/m^3 average tariff (World Bank, 1982, p. 22).

[13] Large industrial companies paid a lower tariff until 1984, when increases in the 'industrial tariff' made it higher than the full domestic tariff.

consumers; water quality and pressure are uniformly good and unaccounted-for-water ... is very satisfactory."

Unaccounted for water. Unaccounted for Water (UFW) in Abidjan has been low by both regional and international standards (see Ménard and Shirley, 2000). In 1980, UFW was about 20% in Abidjan and was about 16% nationally. Since metering has been close to 100% since well before the 1988 reform, UFW is measured quite accurately.

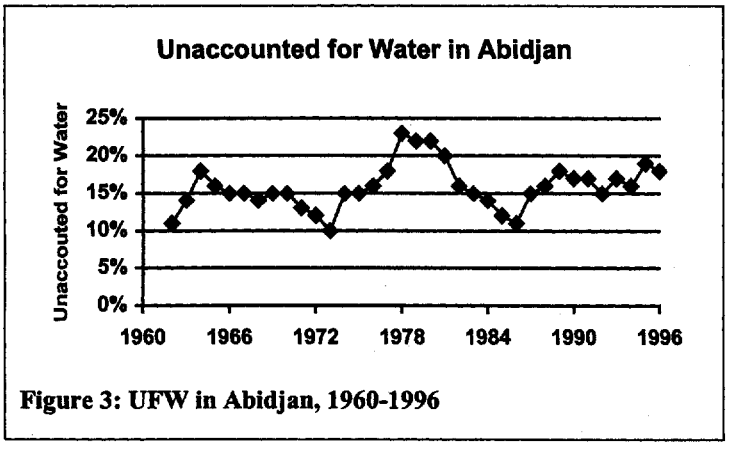

Figure 3: UFW in Abidjan, 1960-1996

Although the low level of UFW is quite impressive, it is not a direct result of any of the reforms. Indeed, apart from a short period between 1978 and 1980, UFW in Abidjan has been consistently less than 20% since the early 1960s (see Figure 3). The success might partially reflect the relatively young age of most water systems in Côte d'Ivoire. Between 1960 and 1995, the network grew from only 176 km to 10,149 km nationwide (SAUR, 1997). In 1974, only 34 urban areas had water systems, compared to 409 by 1995. Another feature that might have contributed to SODECI's success with UFW is that SODECI has been responsible for maintenance of the entire system. In contrast, responsibility for maintenance has been divided between two agencies, SEEG and SONEG, in Guinea, generating conflict and ambiguities in decision-making (see Ménard and Clarke, 2000). This emphasizes the importance of well-defined responsibilities.

Billing and collection. By the early 1980s, SODECI's commercial operations (i.e., billing and collection) were strong by regional standards. Metering were almost universal, billing, which was computerized, was executed efficiently (as demonstrated by the low level of UFW) and collection rates from the private sector were high (World Bank, 1982, p. 9).[14] In 1980, accounts receivable from the private sector accounted for about six months of private sales (see Figure 12).[15] Given the delays associated with hand delivery and that no direct debit system existed, meaning that bills had to be paid at local kiosks, this was quite impressive. One factor that might account for the high collection rate was that

[14] Indeed, SODECI partially owned a meter assembly company (World Bank, 1982, p.21)

[15] Private sales are estimated as 75% of total sales. Private sales accounted for about 72% of sales (World Bank, 1977) in 1973, 78% of sales in 1987 and 74% of sales in 1992 (World Bank, 1993).

private sector consumers were routinely cut off for non-payment. Further, households were entitled to receive a free 'social' connection only once. This gave them a strong incentive to pay their bill regularly since if they were cut off, in addition to paying the overdue bills, they would have to pay a large reconnection fee.

The collection rate from the public sector was considerably lower. By 1980, public sector accounts receivable were over one year of public sector sales (see Figure 12).[16] Most overdue public bills, at this time, were from public institutions such as universities and hospitals. Part of the problem was that SODECI was not allowed to cut off public sector customers who were delinquent (World Bank, 1995, p.6). Because of this, public sector customers had only a weak incentives to pay their bills in a timely manner.

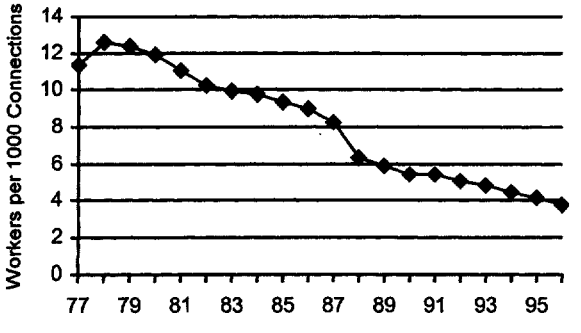

Figure 4: Workers Per 1,000 Connections (nationally)
Source: SODECI.

Labor productivity. Labor productivity has improved continuously since the mid-1970s and, by regional standards, labor productivity at SODECI was quite high by the mid-1980s. SODECI had approximately 10 workers per 1000 connections in the early 1980s, compared to about 24, 32, and 34 employees per 1000 connections in Benin, Togo and Guinea respectively. Although, SODECI initially relied heavily on expatriates for managerial and technical skills, it was slowly reducing its reliance upon them. By the early 1980s, there were less than 20 expatriate workers in SODECI, compared to 43 in 1978 (SODECI, various). It accomplished this through an extensive training program designed to increase the skills of local employees. In 1974, SODECI opened a training facility that trained many SODECI employees, including significant number of workers who later moved to the government ministries responsible for regulation.

In part, the high productivity reflects the commercial orientation of SODECI, which dominates the company despite the small government holding. Both expatriate and local managers receive high salaries and promotions are based upon performance. For workers, SODECI provided stable jobs in an economic environment where most private jobs are

[16] See footnote 15.

highly unstable. Evaluations by local managers determine about 20% of workers' salaries, giving managers greater responsibility. In addition, SODECI has a "social fund" to finance social activities and help employees with specific needs (e.g., for housing) and a training program to help employees improve both their skills and their chances for promotions.

Unconnected households. In the early 1980s, since there were few public standpipes—only about 30 in the entire city (World Bank, 1982), most unconnected households got water from private water vendors or from wells.[17] At that time, and even now, resellers played an active role in providing water to unconnected households. Compound owners often sold water to their tenants (the cost depending upon the volume sold) and other individuals sold water to unconnected neighbors. This provided extra income to the owner, while allowing poor households access to potable water without having to pay access charges or face regular bills.[18] Water from the system was trucked to unconnected areas by professional water vendors. Although this was officially not allowed, it was tolerated as a means of providing water to unauthorized residential areas. In some low-lying, and less wealthy, areas (e.g., Treichville, Marcory, and Koumassi), households have wells in their compounds. Since the water from these wells is salty and can be heavily contaminated, it is not generally used for drinking. However, in some areas that are particularly poor (e.g., Treichville), households also drink the water despite the negative impact on health.

Industrial enterprises were also allowed to use water from wells, but only after they had been granted permission from the government to do so. In addition, they had to pay SODECI for the use of groundwater resources and the disposal of wastewater. In practice, many enterprises were exempt from these requirements, failed to register their boreholes, or failed to pay the required fee. In the late 1980s, it was estimated that less than 20% of fees were collected from inventoried boreholes (World Bank, 1990, p. 65).

Sewerage. Although recent studies have shown that the gains from improved water supply are far greater when sewerage is also improved (Esrey, 1996), sewerage service has always been separate from water supply in Abidjan.[19] The sewerage system in Abidjan

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[17] According to a 1987 study (Diahou, 1994), about 45.7% of non-connected households got their water from resellers and 41.5% from standpipes and wells

[18] In the early 1980s, World Bank (1982, p. 37) reports that 10 liters of water cost about CFAF 10. This implies a total cost of CFAF 1000/m^3. At this time, the official (non-social) tariff was CFAF 224/m^3. The cost seemed similar in 1997. In one compound, in the neighborhood of Adjamé, a connection provided water to the (extended) family of 15 persons and the owner also sold water to 10 tenants. The prices were as follow : 5 CFA for a bag, 25 CFA for a frozen bag, 25 CFA for a basin and 150 CFA for a barrel of 200 liters (e.g., 750 CFA per cubic meter ; by comparison, the domestic rate at that time for an official connection was of 286 CFA per cubic meter)

[19] Abidjan was, and remains, the only city with piped sewerage in Côte d'Ivoire. A few other cities have rudimentary sewerage/drainage systems (World Bank, 1999).

was less developed than the water system even before reform. In 1975, there were about 34,900 sewerage connections, serving about 227,000 people—about 24% of the population (World Bank, 1986a). An additional 44% of the population used septic tanks and pit latrines, while the rest of the population disposed of waste water and sewerage in unlined pits and water courses (World Bank, 1986a). There were no sewerage treatment plants and, therefore, untreated sewerage was dumped into the Ebrié Lagoon, around which the city was built. By the early 1970s, this dumping had overwhelmed the Lagoon's natural purification ability and large parts were highly polluted. As part of a long-term plan to improve the system, two World Bank supported projects attempted to increase coverage and to divert the sewerage to areas of the lagoon where natural purification was strongest. In the medium term, the government intended to by-pass the lagoon altogether by constructing an ocean outflow pipe and pumping the sewerage out into the deep ocean. Two World Bank projects increased sewerage coverage quite substantially in the 1970s and 1980s. By 1985, there were 60,000 connections serving an estimated 635,000 people—about 38% of Abidjan's population. In comparison, there were over 90,000 connections to the water system.

Although SODECI often had limited maintenance contracts for parts of the system, its role in the sector has been small and has always been separate from its role in water supply. Before 1974, the municipal governments were formally responsible for sewerage.[20] SODECI had a limited maintenance contract for some parts of Abidjan's sewerage system and collected a small surcharge on water (CFAF 4.5/m^3) to finance the system (World Bank, 1974). In 1974, the sewerage subsector was reorganized, with the central government becoming more involved in the sector. A public agency, SETU, became responsible for planning and contracting new investment and a sister agency to the FNH, the *Fonds National de l'Assainissement* (*FNA*) was given responsibility for sector receipts and payments (including debt service and financing investment). Through a management contract, SODECI became responsible for the operation and (limited) maintenance of the sewerage system and continued collecting a surcharge on water.[21] Responsibility for the planning, design and construction of sewage facilities was transferred from SETU to the *Direction de l'Eau* in April 1984 (World Bank, 1986a).

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[20] Originally, the *Municipality of Abidjan* was primarily responsible for the system. Once urban development spilled over into the neighboring *Municipality of Bingervilles*, the two municipalities shared responsibility. However, since they did not have the resources to manage the sector, the *Ministry of Public Works*; the *Société d'Equipement des Terrains Urbains* (*SETU*), a government owned corporation, and various housing development companies constructed most sewers. Since these agencies failed to work together, the sewerage system was poorly coordinated and non-uniform.

[21] There was also a surcharge on property taxes, which the FNA used to finance debt service and investment related to drainage.

III Institutional Endowment at the Time of Reform

A central hypothesis of our research is that the feasibility and sustainability of reform relies heavily upon the credibility and stability of government commitments. At least four aspects of the institutional environment in Côte d'Ivoire increased the credibility of the government's commitment to private sector participation in the water sector. First, for nearly forty years following independence, the Ivoirian government was stable and, consequently, there was little threat of sudden changes in policy due to the violent overthrow of the government. Further, although a single party dominated Ivoirian politics, the party maintained its grip on power through a tradition of extended political consensus. This restricted arbitrary action by the executive by making sharp changes in policy more difficult. Second, partly due to the tradition of extended consensus and despite the single party state, Côte d'Ivoire developed a bureaucracy and judiciary that, by regional standards, were quite professional. This promoted the credibility and stability of government policy. Third, the government adopted a pragmatic position in its relations with the West. This resulted in a strong relationship with both the donor community and the French Government, increasing the confidence of foreign (especially French) investors. Finally, also contributing to investor confidence, the Government had a long-standing policy of encouraging private sector participation in the economy, in general, and in the water sector, in particular. Together, these four factors reduced the likelihood that the government would arbitrarily expropriate private investment and boosted confidence in the Ivoirian economy.

III.1 Credibility: Historical Background

Political stability. In sharp contrast to other West African countries, Côte d'Ivoire was politically and socially stable for close to forty years following independence. The political institutions that developed define what has been called an 'illiberal democracy.' Although a single party, the *Parti Démocratique de la Côte d'Ivoire* (PDCI) dominated government, it ruled through a process of extended consensus and, thus, was not a classic dictatorship.[22] Further, Ivoirian institutions proved to be capable of making major adjustments, surviving a severe economic downturn in the 1980s and 1990s.

The PDCI, led by its charismatic leader Felix Houphouët-Boigny, dominated Ivoirian politics even before independence. Following independence, even though the Constitution continued to allow other parties to exist, Côte d'Ivoire quickly became a

[22] One plausible reason for the important of consensus in Ivoirian politics is that no single ethnic group was large enough to impose its will on other groups. Consequently, President Houphouët-Boigny, who was from a very minor group, had to perfect the politics of inclusion (Handloff, 1999, p. xxxix).

single party state. However, single party rule in Côte d'Ivoire was quite different from single party rule in most other West African countries. Rather than eliminating opponents through arrest and exile, the PDCI eliminated opposition by progressively absorbing other political groups. Leaders of opposition groups were given influential and lucrative positions in the government or the PDCI to ensure their cooperation (e.g., the "Political Board" elected by the Congress of the Party included leaders of most political tendencies). As a consequence of this policy, the PDCI became more ideologically and ethnically diverse over time and gained the support of most ethnic groups.[23]

Further, although the unicameral assembly was (and remained through the 1990s) dominated by the PDCI, it promoted stability by allowing local and tribal interests to be involved in the decision-making process. This diffused tension and made redistribution between regions easier (e.g., the cross-subsidization between Abidjan and secondary cities in the water sector). In addition to promoting stability, the institutions that supported the PDCI's policy of building consensus also proved to be an informal constraint on arbitrary action by the executive and, consequently, increased the confidence of private investors.

To summarize, notwithstanding democratization in the 1990s, a single party has dominated Côte d'Ivoire for nearly forty years. In general, the party has worked as a coalition and has absorbed many opponents. Due to this, and to the charismatic figure of President Houphoüet-Boigny, the regime has remained remarkably stable, even during major economic crises. Moreover, the regime has shown a remarkable capacity to adapt (e.g., after the death of President Houphoüet-Boigny). This stability makes the government's commitment to contractual arrangements more credible and, therefore, ultimately makes reform sustainable.[24]

A pragmatic policy toward the west. Following independence, the Ivoirian government adopted a pragmatic policy towards France, the colonial power that had ruled Côte d'Ivoire before independence, and other Western countries. Consequently, Côte d'Ivoire received considerable support from both France and international organizations in the years following independence.[25] The policies encouraged French firms involved in West Africa to invest in Côte d'Ivoire and French expatriates from other former colonies to move to Côte d'Ivoire, contributing to the economic boom that followed independence.

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[23] For example, Houphoüet-Boigny went through "initiations" according to the rites of the major groups, thus consolidating his legitimacy by rooting it in local traditions.

[24] The military coup that shook the government and the Ivoirian society in late 1999, when this paper was being finished, does not seem to have affected so far the basic trends described in what follows.

[25] The support of international organizations became particularly obvious in the late seventies and early eighties, when a large amount of international resources were provided to help the regime confront the deteriorating economic conditions.

There are several plausible reasons for the limited reaction against the colonial regime following independence. First, the French administration's policies in Côte d'Ivoire might have been less restrictive than in other West African colonies, provoking a more moderate reaction following independence.[26] In part, the less restrictive French rule reflected the French view that Côte d'Ivoire was a relatively minor territory with limited resources, poor access to the sea for most of the country, and weak prospects for development. Second, the pragmatic policy was a response to political developments in Côte d'Ivoire before independence. Young (1982, p. 193-194) argues that, in contrast to neighboring countries, the main supporters of the PDCI, which was the most important pre-independence movement in Côte d'Ivoire, had an interest in promoting capitalism and good relations with the former colonial power. The PDCI grew out of an association of relatively wealthy African coffee and cocoa planters, the *Syndicat Agricole Africain.* Consequently, following independence, the PDCI adopted policies that would benefit the planters, who were capitalist in outlook and dependent upon exports. Although the character of the PDCI changed as it absorbed other political groups, the economic success of Côte d'Ivoire following independence legitimized its policies towards foreign investment and the private sector.

Stable institutions. The credibility of Ivoirian government is also backed by a set of stable institutions, based upon those in France. By regional standards, Côte d'Ivoire developed a relatively efficient and well-trained bureaucracy. The French policy of assimilation, which encouraged the repression of local cultural traditions, resulted in the colonial administration training a local elite. Consequently, by Independence, Côte d'Ivoire had a relatively large pool of well-trained individuals, with technical as well as managerial expertise. Further, in areas where local expertise was lacking, Côte d'Ivoire's pragmatic policy towards France allowed it to rely upon expatriates after independence (Young, 1982). Finally, perhaps due to the political diversity within the PDCI, the bureaucracy does not function only according to political criteria as is usual in a single party regime.

Most of the public agencies involved in the water sector are thought to be competent by observers in the private operator, in international organizations and within the Ivoirian government. The *Bureau National d'Etudes Technique et de Développement* (BNEDT), which currently advises the main regulator, the *Direction de l'Eau*, on technical issues related to investment, has considerable expertise in this area. Similarly, the

[26] This does not mean that there were no restrictions. Many standard colonial policies were implemented. Administration and export activities were dominated by the French and many laws restricted local freedom (e.g., political parties that were specific to Côte d'Ivoire were not allowed).

institution responsible for managing sector debt, the *Caisse Autonome d'Amortissement (CAA)*, is also seen as competent.

In addition to a relatively professional bureaucracy, the judiciary is active and, although the Supreme Court (now called the Constitutional Council) is only a limited check on executive action, the judicial system is relatively developed. Judges are trained for two years after graduation from University and there is a tradition of judicial intervention to settle commercial disputes.[27] Contracts can be enforced, although the cost of appealing to the Courts is high in financial and, more importantly, symbolic terms.

A tradition of private sector participation in the economy. In addition to a pragmatic approach to the West, the Ivoirian government also adopted policies that encouraged private sector participation in the economy. As discussed above, these policies, which were supported by the relatively wealthy African planters who were the original supporters of the PDCI, were legitimized by the economic success that followed independence. This outlook towards the private sector, in part, explains the government's decision to allow SODECI to continue operating in Abidjan after independence. However, as noted by Young (1982, p. 192), the government's capitalist outlook was tempered by a tradition of public intervention, particularly in the development of infrastructure. This tradition is consistent with the 1967 decision to make the public sector responsible for investment in the water sector. The long involvement of SODECI in the water sector makes this commitment especially credible in this sector.

IV Motivation for Reform

In contrast to the other case studies, in which reform resulted from a combination of a macroeconomic crisis, a realignment of political forces and a sector crisis, a macroeconomic crisis alone was the main motivation for reform of the water sector in Cote d'Ivoire. The macroeconomic crisis reduced the public resources available for investment, slowing expansion of the water system, and resulted in reductions in formal sector employment and wages, making high tariffs more painful for consumers. However, the overall performance of the system remained strong, especially by regional standards. In the absence of either a sector-specific crisis or a major change in the government's support base, the macroeconomic crisis encouraged only a minor reform aimed at lowering tariffs and financing investment through sector revenues. Since the crisis had had a greater effect on the finances of the government agencies involved in the sector than on SODECI's finances and since the government had been responsible for investment, sector problems

[27] In rural areas, this is complemented by the active role of the "tribunaux coutumiers", based on the traditional privilege of the elders.

could not be blamed on the private operator. Consequently, there was little pressure to reduce the private operator's role in the sector and, in fact, the private operator's responsibilities were increased following reform.

IV.1 A Major Macroeconomic Crisis

After twenty years of sustained growth—GDP growth averaged over 8% per year between 1961 and 1979—Côte d'Ivoire was hit by a series of macroeconomic shocks. Serious drops in cocoa and coffee prices (which represented over 60% of Côte d'Ivoire's merchandise exports in 1979), led to a 30% decrease in the price of exports between 1977 and 1980 (Demery, 1994). This radically slowed growth, and, combined with an overly ambitious development program in the late 1970s, resulted in a large increase in the public sector deficit.[28] This, in turn, caused a dramatic increase in public sector debt, which grew from 25% to 83% of GDP between 1975 and 1985 (see Figure 5).

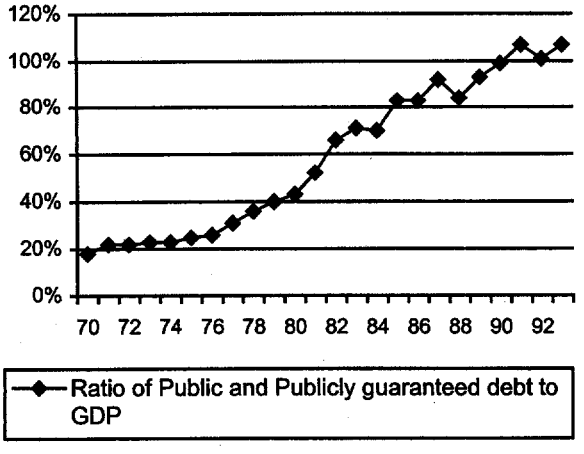

Figure 5: Public Debt as Percent of GDP

Source: World Bank (1998).

To reverse the disturbing economic trends, the government implemented a series of Structural Adjustment Programs (SAPs).[29] Public investment was severely reduced (dropping over 50% between 1982 and 1984); water, electricity, and transportation tariffs were raised significantly; wages were frozen; and state owned enterprises were closed and privatized. However, the economic problems continued, with real per capita GDP dropping 33% between 1980 and 1985. In spite of a second SAP between 1984 and 1986, and a brief spurt of growth following a temporary improvement in the cacao and coffee markets, coffee and cacao prices reversed again in the late 1980s and the economic deterioration

[28] The public sector deficit was 12% of GDP in 1981 and 8% of GDP in 1987. In addition, the CFA Franc became overvalued (the CFA Franc gained close to 50% against the US$ between 1980 and 1986).

[29] See Demery (1994) for a description of Côte d'Ivoire's structural adjustment programs, and Berthelemy and Bourguignon (1996) for an analysis of macroeconomic trends in the period under review.

continued.[30] Although the government responded with new measures to attract investment and liberalize the economy, the measures failed to reverse the economic decline. Further attempts at stabilization in the early 1990s failed and the economy did not start to recover until the devaluation of the CFA Franc in 1994. It is in this context that reform of the water sector was proposed and implemented in the late 1980s.[31]

IV.2 Political Unrest and Democratization

The long period of economic crisis was accompanied by a significant evolution in political institutions. Since the success of the Ivoirian economy in the 1960s and 1970s contributed to the legitimacy of PDCI rule, the economy's collapse in the early 1980s led to an increase in unrest and political instability. After the first structural adjustment program (SAP) was adopted in 1983, opposition to the government developed. Initially the opposition's main supporters were students and teachers, but gradually it gained support in urban areas, including from public workers whose wages were falling in real terms. Although the movement was not strong enough to encourage immediate democratization (i.e., the PDCI remained the only legal party), it did encourage some basic reforms.[32]

The continuing economic problems led to further political unrest throughout the 1980s. In 1990, unrest and violence increased and riots and strikes by public sector workers and students forced the government to abandon major parts of its IMF and World Bank backed Structural Adjustment Program—most notably, proposed cuts in public sector wages. It also led the government to accept the introduction of formal democracy. On May 30, 1990, nine political parties were legally recognized. Despite the economic

[30] The long-term downward price trend appears to have been due to an increase in worldwide production. Cocoa and coffee production increased 66% and 20% respectively between 1978 and 1988. The new decline led to per capita GDP falling at an annual rate of -2.2% between 1986 and 1990. Although the brief recovery in the mid-1980s led to a reduction in the public sector deficit, which fell to 3.8% of GDP in 1986, the continued decline meant the improvement was short-lived and the deficit reached 16.6% of GDP by 1989.

[31] Data in this section on fiscal deficits, growth, exchange rates, exports and investment are from World Bank (1998). Data on international Coffee and Cocoa production are from Food and Agriculture Organization (1998b). Per capita GDP is PPP adjusted GDP (in US dollars from World Bank (1998).

[32] In 1980, President Houphouët-Boigny had permitted open elections (within the PDCI) to the National Assembly, resulting in the replacement of two-thirds of the legislature. This was expanded to local party and municipal offices in 1985. In 1987, the state-controlled broadcaster began to allow (controlled) political debate on one of its shows (Handloff, 1991, p. 167-68).

conditions, elections in October of that year confirmed the continuing popularity and influence of President Houphouët-Boigny and the PDCI.[33]

Although the reform of the water system occurred during the transition to democracy, it does not seem that this had a significant effect on the nature of reform. In the late 1980s when the reform was proposed and implemented, opposition parties were still illegal and the PDCI remained dominant, and reasonably popular, throughout Ivoirian society (even in urban areas). Although the economic crisis had provoked unrest, no credible alternative to the PDCI had emerged (and still had not even by the mid-1990s) and, therefore, there was no large shift in political forces. Consequently, although the falling wages and social unrest probably motivated the government to look for ways to reduce tariffs, since sector performance was reasonable there was little pressure for wholesale sector reform.

IV.3 The Effect of the Macroeconomic Crisis on Sector Performance

In most respects, the water system in Abidjan continued to perform well in the early-mid 1980s (see previous section)—quality remained high, UFW remained low, the commercial performance of the operator remained strong and productivity continued to improve. However, the macroeconomic crisis negatively impacted sector finances, especially for the public entities responsible for debt service and investment. Although this did not threaten the system with immediate collapse, it did raise questions about the sustainability of the current system, especially related to future expansion, and led to a modest reform designed to tackle the most pressing issues.

The most direct impact that the macroeconomic crisis had on sector performance was that it slowed demand growth. The amount of water billed in Abidjan, which had been growing at an average rate of 8% in the 1970s, stagnated in the early 1980s (see Figure 6). Since, even at this time, most consumption was metered this had an immediate impact on sector revenues. The main reason for the stagnation was a collapse in demand from large industrial and commercial consumers, which fell 30% between 1980 and 1985 (World Bank, 1990, p.21). Although the number of connections continued to grow, most new connections were 'social connections' for poor households who consumed little water. Consequently, the consumption from new connections only just offset the decline in industrial consumption and the amount of water that was billed stagnated.

[33] According to official results, President Houphouët-Boigny received 81.7% of the vote in the presidential election and the PDCI won 163 of the 175 seats in the National Assembly. The opposition claimed that the result was fraudulent.

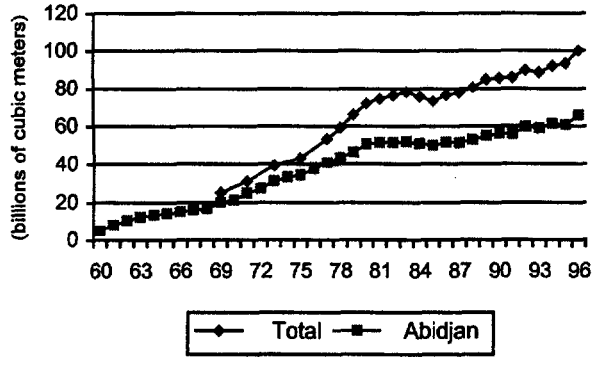

Figure 6: Water Billed (billions of cubic meters)

Source: SODECI.

To reduce the effect of the slow growth on sector finances, the government implemented a large price increase in 1984 (see Table 1). Although, due to concerns about social unrest, tariffs for small consumers were unchanged, prices for industrial consumers were increased dramatically—from CFAF 215/m^3 ($0.45) to CFAF 458/m^3 ($0.95). This large price increase had a significant impact on the behavior of large users, already squeezed by the macroeconomic crisis, who started to reduce waste, recycle water, and rely upon their own wells.[34] Consequently, despite a recovery in the Ivoirian economy, total demand fell in 1984 and 1985 (see Figure 6).

Although the slower growth affected the entire sector, SODECI was shielded from the effect on sector revenues in two ways. First, SODECI's compensation was based upon projected, not actual, revenues. Consequently, since the slower demand growth was largely unanticipated in the early years of the crisis, SODECI was partially protected from the slowdown. Second, SODECI's remuneration per cubic meter was about the same for all tariff levels (between about CFAF 150 and 180/m^3 in 1984). Consequently, since demand from small users increased in the early-mid 1980s, SODECI's additional revenues from small consumers made up for the decrease in revenue due to the drop in industrial consumption.

[34] Although, technically, industrial users had to get permission to drill wells and had to pay an extraction fee to SODECI, legal loopholes and poor compliance meant that very few actually did.

Table 1: Tariff Rates in Côte d'Ivoire
(in CFA Fr)

	1983	*1984-Sept. 1987*	*Oct. 1987 - Jan. 1994*	*Jan 1994* - May 1996*	*May 1996 – 1999****	*Percentage change in real terms, 1987-1997*
"Social" Tariff (up to $18m^3$)**	187	187	159	159	184	**–36.1%**
"Domestic" Tariff (19 to $90m^3$)	261	261	209	230	286	**–25.7%**
"Normal" Tariff (91 to $300m^3$)	300	330	307	368	464	**–16.5%**
"Industrial" Tariff (more than $300m^3$)***	252	458	350	424	532	**–28.7%**
Administrative Tariff	261	261	261	311	390	**–17.5%**

* Tariff was approved in April 1994, but was applied retrospectively from January 12, 1994 (the date of the devaluation of the CFA Franc).
** Minimum consumption is $9m^3$. If consumption is less than $9m^3$, it is billed as $9m^3$. Before 1987, there was a fee for 'social' connections that resulted in the average price shown here.
*** Tariff was reduced from CFAF 412 to CFAF 350 in 1990, as a condition for second tranche release of a World Bank loan.
**** Tariffs were in force through **at least** until early 1999 (World Bank, 1999).

In contrast, remuneration per cubic meter for the government funds (i.e., the FNH and FNA) was far lower for smaller consumers than for industrial consumers (CFAF $0/m^3$ for small users compared to $300/m^3$ for industrial consumers). In fact, about 70% of the revenues from the 'rental fee' paid to the government funds came from a few hundred large industrial users by the time of reform (World Bank, 1990, p. 21). The increase in demand from small users, therefore, failed to compensate the government for the large drop in industrial consumption. This significantly reduced the FNH's ability to service sector debt and, by 1986, it was estimated that FNH resources could cover only 60% of sector debt service (World Bank, 1990, p. 19).

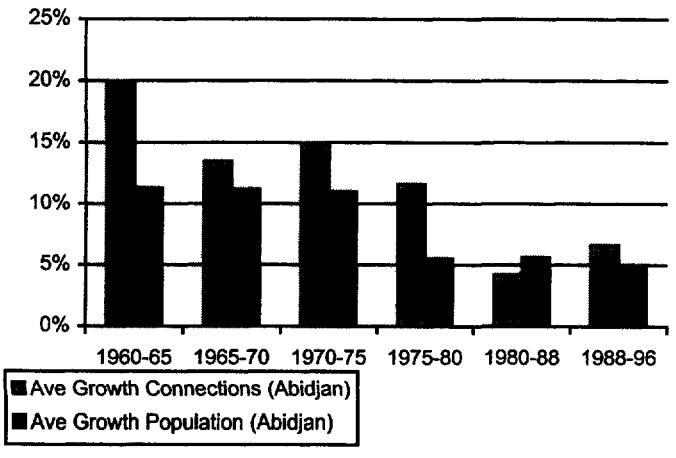

Figure 7: Growth of Connections and Population in Abidjan

Source: SODECI (various); World Bank (1998).

Through its impact on public finances, the crisis had a second, more indirect effect, on the sector. As noted earlier, the crisis resulted in large deficits and a massive increase in sector debt. In response, as part of the structural adjustment program, the government was forced to reduce spending, including spending on public investment. Since population growth remained fast (see Figure 1) and over 90% of investment was financed through government subsidies and public borrowing, this was a serious threat to the continued development of the water sector.[35] Due to this, the growth in the number of connections started to lag population growth (see Figure 7) and, consequently, coverage fell (see Figure 9). The problems in public finances also increased overdue bills from the public sector, further impacting sector finances. Between 1980 and 1985, the ratio of accounts receivable to total sales increased from about 15 months to over three years for the public sector (see Figure 12). Since the public sector accounted for about 25% of total revenue, this was a significant problem.

Although sector finances suffered due to the macroeconomic crisis, the crisis did not result in a major sector crisis and, consequently, failed to motivate a major sector reform. One reason for this was that the financial difficulties (i.e., the reduced resources for debt service and future investment) had only a minor impact on current consumers. Indeed, since quality remained high and tariffs for non-industrial consumers were unaffected, sector problems were largely invisible to most non-industrial consumers. This meant that pressure for reform was not widespread.

[35] Between 1975 and 1987, 80% of investment was funded from borrowing from bilateral and multilateral agencies (52% of lending, including soft-term lending) and from commercial banks (48% of lending including lending by the Banque Centrale des Etats d'Afrique de l'Ouest). In addition, 13% of investment was funded from government subsidies. The remaining 7% was funded from internal cash generation (World Bank, 1990, p. 24). This need also increased the importance of foreign aid and, therefore, the ability of donors to demand reform. In exchange for support, mostly from France, the IMF and the World Bank, international lenders pushed for increased autonomy for the private operator.

Although the private operator had been responsible for operations and maintenance, the problems did not lead to calls for reducing private sector participation in the sector. In large part, this was because the problems did not appear to be due to SODECI. In fact, the public entities had greater financial problems and were responsible for both areas where problems were evident—debt service and investment. Further, mistakes made by the *Direction de l'Eau* reduced confidence in the public entities involved in the sector. Despite the economic problems, the *Direction de l'Eau* continued to forecast fast growth in water demand in the 1980s. It, therefore, continued to invest in productive capacity in Abidjan and the secondary centers and, by the mid-1980s, the utilization rate for productive capacity was very low.[36] Since the crunch in investment had slowed connection growth and caused a drop in the coverage rates (see Figure 9), the *Direction de l'Eau* was accused of misdirecting investment towards large-scale production facilities. This, in part, explains why the *Direction de l'Eau's* responsibilities were reduced following reform.

V Contractual Arrangement and Institutional Complexities

Although the macroeconomic crisis had a negative effect on some aspects of sector performance, in the absence of a sector crisis or a major realignment of political forces, it failed to provoke a complete reorganization of the sector. Consequently, although the contractual arrangement was modified in some significant ways, the 1988 reform was not a radical departure from the pre-existing situation and it did not disrupt the relationship between the various partners to the contract. The success of the previous arrangement made the initial reform *feasible,* while the credible commitments built by the Ivoirian government, which allowed the contractual arrangement to continue to evolve over time, ensured *sustainability.* In this section, we examine the design and implementation of the contractual arrangement that came into effect in July 1988 and discuss the subsequent adjustments. To explain the success of the arrangement and its limitations, we focus the analysis on the interaction between micro-institutions and the main characteristics of the contract, especially its informational scheme and incentive factors.

V.1 Changes in Micro-Institutions

The new twenty-year contract, which became effective in July 1988, affected sector organization in several ways. First, SODECI's responsibilities related to investment planning and implementation were increased, its compensation was reduced, and it was

[36] In 1987, it was estimated to be about 50% in Abidjan and 28% in the secondary centers (World Bank, 1990, p. 20). Recent estimates suggest the true utilization rate was, however, probably higher than this. At the end of 1993, SODECI estimated that the utilization rate was about 90% (World Bank, 1994, p.6), even though actual production had increased by less than 20% over this period.

exposed to greater risk. Second, the reform brought BNEDT (*Bureau National d'Etudes Techniques et de Développement)*, an additional public agency into the sector.[37] This had a significant effect on responsibilities of the *Direction de l'Eau*, which had been responsible for both investment and monitoring the contract with SODECI before reform. Third, the macroeconomic crisis and the large government debt convinced the government and international donors that investment should be self-financed. Part of the water tariff was to be paid to a new fund, the *Fonds de Développement de l'Eau (FDE)*, which would be used to finance investment. Finally, a new entity, the *Fonds National de l'Eau (FNE)*, which was formed by merging the insolvent *Fonds National de l'Hydraulique (FNH)* with its solvent sister agency the *Fonds National de l'Assainissement (FNA),* became responsible for debt service.

Initial negotiations between the World Bank, the Direction de l'Eau and SODECI had focused on implementing a full concession contract. Under this agreement, SODECI would have assumed all responsibilities related to investment and would have become responsible for sector debt. However, after BNEDT became involved in the negotiations, it questioned whether sectoral revenues would cover debt service requirements in the years immediately following reform. SODECI then asserted that the imbalance between its equity and sectoral liabilities would create considerable risk (World Bank, 1993). The unfavorable economic environment and the related social tensions and political risks were also part of the background to the negotiation. The idea of a full concession was therefore abandoned in favor of a contract that is close to a lease, but which gives the private operator significant control over investment.

V.1.A Public Agencies: Who Does What?

The reform resulted in a major realignment of responsibilities for the various government agencies involved in the sector. One significant change was that a public agency, BNETD, which had not been active in the sector before reform, assumed a pivotal role. BNEDT became involved in the sector when, in January 1987, the President made it responsible for the preparation of a series of Sectoral Adjustment Loans (SECALs) from the World Bank. Since these loans included a Water Supply and Sanitation SECAL, designed to support sector reform, BNEDT assumed responsibility for negotiating the new contract with SODECI. Figure 8 shows sector organization as of the end of 1997.

[37] At the time of reform, BNEDT was called DCGTx (the "*Direction Centrale des Grands Travaux*"). We refer to it as BNEDT throughout the text for ease of exposition.

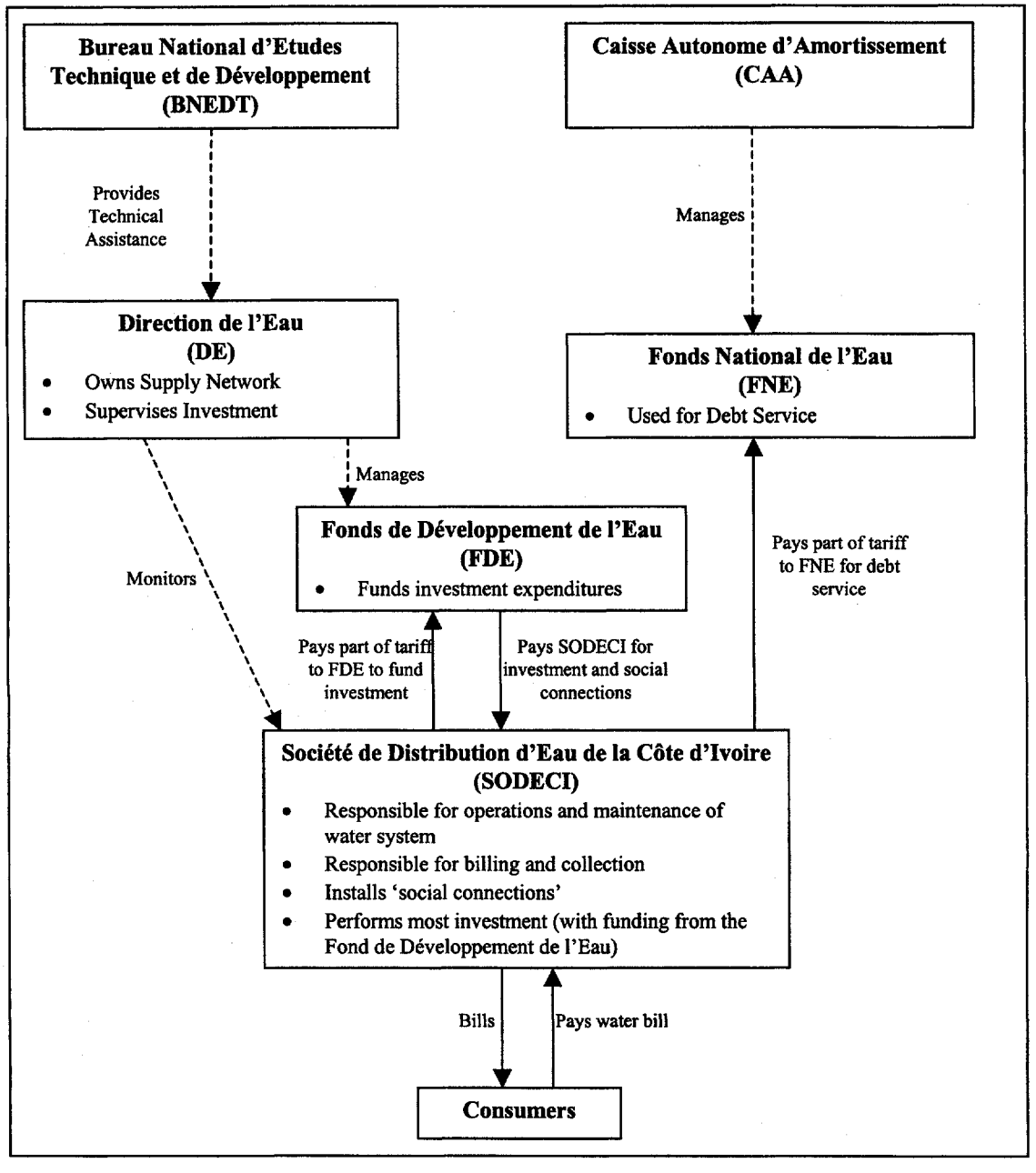

Figure 8: Sector Organization

After the negotiations with the World Bank and SODECI were complete, BNEDT continued to be active in the sector. As discussed in detail below, the 1988 reform transferred responsibility for investment planning and implementation from the *Direction de l'Eau* to SODECI. At the same time, BNEDT assumed responsibility for supervising SODECI's investment activities. Several factors influenced the transfer of responsibility from the *Direction de l'Eau* to BNEDT. First, BNEDT's successful contract negotiations with SODECI convinced many observers that BNEDT was competent to assume the role.

Second, the powerful director of BNETD, Antoine Cesareo, who was close to the President Houphouët-Boigny used his influence to expand BNEDT's role. Finally, the *Direction de l'Eau's* perceived problems managing investment (i.e., the over-investment in production facilities and under-investment in the distribution network) before reform made observers question its competence.

Conflicting micro-institutions. Although it no longer had direct responsibility for investment, the *Direction de l'Eau* remained responsible for monitoring the contract with SODECI and negotiating the price of water. This created some ambiguity in its relationship with BNEDT and, subsequently, led to tension between the two agencies, which was aggravated by ill will due to the transfer and by the different skills and priorities of the two agencies.

The *Direction de l'Eau* was, and remains, far smaller than BNEDT (staffs of 250 and 1000 respectively in 1998). It is part of the METT, a very large ministry, and has most of its expertise in rural water supply. Consequently, a significant part of its staff is dispersed throughout the country. This provides them with a detailed knowledge of the situation outside of Abidjan, but leaves them with neither the time nor the expertise to closely monitor the contract with SODECI. Consequently, it tended to adopt a hands-off approach towards SODECI.

BNEDT is located in the Prime Minister's office and its directors have been close to the highest levels of Government. This has allowed it to overrule line ministry decisions. It proposed, planned and implemented most major public works and, because of its special status (including higher salaries) attracted an excellent group of engineers, mostly trained abroad. BNEDT took a very active role in planning and developing sector facilities and, consequently, closely monitored and continuously interfered with SODECI's plans.

Tensions between these agencies, and between the agencies and the private operator developed over time. The conflict forced SODECI, which implemented most investment, to get approval from both the *Direction de l'Eau* and BNEDT, making the approval process long, inefficient and costly. This further increased tension between the three partners, making investment decisions even more difficult and leading international lenders to push for change. In May 1995, a formal agreement was signed that made the *Direction de l'Eau* responsible for supervising new investment and reducing BNETD to a technical consultant to the *Direction de l'Eau.* After a difficult adjustment period, all participants seem happy with the new system.[38] This supports the hypothesis that water reform success

[38] Although the 1995 adjustment clarified the relationship between the *Direction de l'Eau* and BNETD, another agency, the *Haut Commissariat à l'Hydraulique* (HCH), was introduced at about the same time. At

depends on clear rules for making decisions and for solving disputes. The 1995 institutional adjustment simplified the decision-making structure, putting one well-identified agency in charge of the sector. The main weakness of the new arrangement is that the *Direction de l'Eau* has only limited technical capacity, reducing the control it has over SODECI.[39]

Investment and risk. Two other public agencies, the *Fonds de Développement de l'Eau* and the *Fonds National de l'Eau* are responsible for financing investment and debt service. The *Fonds de Développement de l'Eau* (FDE) was created to finance new investment and 'social connections' for low-income consumers. Its resources primarily come from the water tariff, through the 'rental fee'. Although it can borrow from lenders, one of the main goals of reform was to make the system largely self-sufficient.[40] In 1997, about 24% of the tariff (CFA FR 76.55) was paid into the *Fond de Développement de l'Eau.*[41] The budget of the FDE, according to *Direction de l'Eau*, was CFAF 7 billion ($11.7 million) in 1997, including CFAF 4 billion ($6.7 million) for Abidjan. 'Social connections' accounted for 50% of investment, maintenance for 20% and system extension for 30% (Field Interviews, 1998).

An additional 14% of the tariff (CFA Fr 44) went to the *Fond National de l'Eau*, which services sector debt and pays for the operation and maintenance of the sewerage

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this time, it was not clear whether the HCH would simply be a coordinating body, where agencies could meet and reach agreement on sector policy, or whether it would be a full agency with regulatory power. Most importantly, the different agencies involved in the sector were unsure whether, and how, the HCH's sector policy might constrain other agency's activities. For example, if the HCH became a regulatory entity, it would presumably manage how the *Direction de l'Eau* monitored the contract with SODECI. There was even the possibility, that it might interfere directly with SODECI's decisions regarding investment or maintenance of the water system. However, recent developments suggest that the HCH's role will be relatively minor, coordinating projects and helping to implement the plans of the regional agencies that monitor the major water basins. Although field interviews suggest that initial tensions have been relaxed recently, it shows how easily uncertainty due to changes in institutional structure within the government can develop.

[39] Other public agencies monitor infrastructure and water quality. In principle, the *Institut National d'Hygiène Publique* (INHP) monitors sanitary standards but, in practice, it is both under-staffed and under-equipped. The result is that SODECI is the main control on water quality. The *Laboratoire National d'Essais et de Métrologie Appliquée* (LANEMA) tests equipment quality, while the *Direction de l'Eau* with technical support from BNEDT, checks that infrastructure conforms to international standards. SODECI directly controls the quality of technical equipment it provides and implemented ISO 9000 standards by the end of 1998.

[40] Between 1987 and 1997, the FDE did not borrow any funds. The 1990 *Sectoral Adjustment Loan* from the World Bank was balance of payments support and, therefore was not linked to specific investments. In 1996, loans from the Caisse Française de Développement and a smaller amount from the German KAW were mostly to cover the Government's debt to SODECI.

[41] In comparison, SODECI received 56% of the tariff (CFAF 182.6) for operations and maintenance of the system.

system.[42] This fund is managed by the *Caisse Autonome d'Amortissement (CAA)*, an agency in the *Ministry of Economy and Finance* that manages public debt. Because new investment was being funded through the tariff rather than through new borrowing, it was hoped after a few years, the FNE would be able to transfer resources to the FDE for investment. In practice this never occurred, due to continued non-payment of bills by the public sector.

V.1.B Private Operator

Under the 1988 contract, SODECI remained responsible for operation and maintenance of all urban water systems, including responsibility for metering, billing and collection from all private and public-sector customers. However, there were several significant changes that affected SODECI's responsibilities, its remuneration and its incentives.

Responsibility for investment. Although the contract specifies that the Republic of Côte d'Ivoire retains ownership of sector assets, most responsibility for investment was transferred to SODECI. As noted earlier, this was due, in part, to suggestions that the *Direction de l'Eau* had inappropriately over-invested in large production facilities at the expense of the distribution network during the early years of the crisis. Formally, the Government remained in charge of supervising investment and managing the *Fonds de Développement de l'Eau* (FDE), while responsibility for planning and executing investment was transferred to SODECI. Because of this, many observers call the contract a concession. However, since SODECI can not borrow to finance investment and, therefore, does not bear any investment-related risk the contract is a *lease* using the terminology of this project.[43] Despite the provisions that made SODECI formally responsible for planning and executing investment, BNEDT actually performed these roles for the first seven years of the lease. As discussed in the next sub-section, when responsibility for supervising investment was transferred from BNEDT to the *Direction de l'Eau*, SODECI's control over investment planning and execution increased substantially.[44] By mutual agreement with the *Direction de l'Eau*, SODECI can implement investments of less than 120 million CFA francs (about $220,000 in 1996) with no tender.[45] The provision was intended to cover daily maintenance of the system and the installation of 'social connections'.

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[42] The final 6% (CFA Fr 20.35) was paid to the government as a value-added tax.

[43] See Ménard and Shirley (2000) for a description of each type of contract.

[44] During field interviews, all participants agreed that BNEDT played a far more active and aggressive role concerning investment planning and execution, than the *Direction de l'Eau* has.

[45] Before the devaluation of the CFA Franc in 1994, the limit was set at CFAF 80 million (about $270,000).

Proponents of this agreement argue this is appropriate since maintenance and the small investments covered by this provision usually need to be implemented quickly and often require substantial coordination with operations to be implemented at least cost. Although public advertising and bidding might lower the amount up-front cost of these investments, they argue the cost of delays and disruption to operations would outweigh the small financial benefit. Opponents note, however, that SODECI has used this provision to split major investments into small lots that could be realized without a tender. They emphasize that no investments were bid between 1993 and 1997 and that very few were bid at any time in the first ten years of the contract. SODECI responds that, due to the economic crisis and subsequent government non-payment, there were no large investments over this period and, therefore most investment was, in fact, for maintenance and social connections. As noted in World Bank (1999, p.30), although the evidence is not conclusive, some studies have suggested that SODECI might be making excessive profits on its infrastructure-related activities.

Although the transfer of responsibility for investment coincided with an improvement in the coverage rate in Abidjan, despite a large drop in investment expenditures, this arrangement has been criticized for several reasons. First, although SODECI controls investment, as it would in a concession contract, it does not bear the financial risk associated with investment. While this might not be a large concern when investment is funded through the tariff, if the government starts to finance significant amounts of investment through government borrowing, SODECI might have an incentive to encourage over-investment or to invest inefficiently. Since sector resources do not appear to be sufficient for funding future investment needs without additional borrowing, this is a distinct possibility. Second, the ambiguous allocation of responsibilities might distort incentives. On the one hand, SODECI's revenues depend upon its capacity to connect and collect, which gives it an incentive to invest efficiently to expand the system. On the other hand, SODECI's incentive to invest may be low since it might prefer to hold funds hostage to government receivables or to try to divert investment funds to its owners. Finally, provisions allowing SODECI to avoid bidding for small investments have reduced competition in the sector, increased information asymmetries, and might have distorted investment decisions (i.e., encouraged excessive investment in social connections and other small-scale investments).

All of these problems have been aggravated by the poor quality of the information available on investment and sector assets—a problem noted in World Bank studies since the period before the 1988 reform (see, for example, World Bank, 1999). Lack of information on investment and assets makes it difficult to assess sector needs and to evaluate current investment policy. Although public agencies often find it difficult to obtain and collect relevant information, especially in cost-plus regulatory schemes, poor

information appears to be an especially significant problem in Côte d'Ivoire. One possible reason for the problem is the large number of public agencies involved in the sector and the overlapping and changing responsibilities. By making it easier for SODECI to conceal information and by making it more difficult for the regulatory agencies to develop the skills required to monitor the contract, this has increased information asymmetries. In addition, the resulting inter-agency disputes might have worsened information flows between the relevant public agencies, further aggravating the problem.

Remuneration. In addition to a change in responsibilities, the new contract reduced SODECI's remuneration. Suggesting that it might allow other companies to bid for the contract, BNEDT managed to negotiate a 20% reduction in the part of the tariff paid to SODECI. The reduction allowed BNEDT to allocate CFAF 28/m^3 for financing investment, while reducing water tariffs.

Rural water. In return for the cut in SODECI's remuneration, in addition to increasing SODECI's control of investment and agreeing not to put the contract out for tender, BNEDT also released SODECI from its responsibility for rural water points. Since SODECI estimated that it lost close to CFAF 2.2 billion between 1982 and 1987 (about 10% of its 1987 revenues) maintaining and operating rural water points, this benefited SODECI greatly.[46] International donors also pressured the government to relieve SODECI of its responsibility for rural water points since they were unhappy with SODECI's performance. A survey in 1986 of the 13,500 rural water points, performed by BNEDT, found that about half were not functioning.

Incentives. Another change was that 'take or pay' provisions were eliminated from the new contract. Before reform, SODECI's remuneration had been based upon the *Direction de l'Eau*'s forecasts of water sales and, therefore, when actual sales had been lower than projected, such as during the crisis, SODECI was entitled to compensation. World Bank (1990, p. 21) estimated that US$11 million had to be paid to SODECI due to the 'take or pay' provisions before reform. In part, the threat of bidding seems to have induced SODECI to agree to this change. SODECI's compensation is now based upon actual collections. Since SODECI also effectively controlled the portion of the tariff that was paid to the FDE for investment, this arrangement maintained SODECI's incentive to collect and bill existing customers and to connect new customers.

This intricacy of responsibilities among several public agencies and the private operator resulted in shifting responsibilities and some confusion over the roles of these

[46] According to World Bank (1990), SODECI estimated that its losses between 1982 and 1987 were close to CFAF 2.2 billion ($6.3 million at 1987 exchange rates). In comparison, SODECI's total revenues in 1987 were about CFAF 28.2 billion.

agencies. The lack of clear rules for conflict resolution created a vacuum that increased SODECI's discretionary power. Binding rules that usually accompany a lease contract (e.g., rules regarding investments) were difficult to implement and gave way to conflicts between ministries, relaxing the constraints that the contract formally imposed on the operator. This severely hampers reform and increases the risk that the private operator will capture rents.

VI Effect of Reform on Sector Performance

Notwithstanding institutional problems and difficulties due to the ambiguous contractual arrangement, the urban water sector continued to perform impressively in the 1990s. Although the system was already functioning well, the 1988 reform and the subsequent adjustments managed to reverse some of the problems related to the macroeconomic crisis, while maintaining most other performance measures. In particular, prices fell in real terms and, despite a drop in investment expenditures when the system became self-financing, the coverage rate in Abidjan improved. Some problems, however, remain—in particular, the tariff failed to provide adequate resources to finance investment and non-payment by the public sector became a serious problem.

The reform also demonstrated the strength of the contractual arrangement. Despite the adverse conditions under which the reform was implemented, the arrangement *per se* was not questioned. Safeguards were considered strong enough to guarantee the sustainability of the system, and, although the credibility of the Government might have been shaken, it was not perceived as a threat to the contract. In fact, the arrangement's ability to absorb major shocks reinforced the idea that the system would be a good model for developing countries inside and outside the region. In this section of the paper, we carefully evaluate the recent performance of the system.[47] Throughout the section, we will mainly focus on those areas where reform affected sector performance.

VI.1 Continued Strong Performance

As discussed in Section II, SODECI was already performing well prior to reform. Many performance measures—UFW, water quality, productivity, and billing and collection—continued to perform well following reform. In this subsection, we briefly discuss these measures, noting how the new contract effected them.

[47] Our case study focuses on Abidjan, which accounts for about 68 % of the water produced by SODECI. Many data, including on number of employees, is not available by city. We try to present data for Abidjan as much as possible. The situation in secondary cities is usually not as favorable as the situation in Abidjan, introducing a bias in our evaluation of Abidjan.

UFW and water quality. UFW remained low following the 1988 reform, remaining between 15 and 20% over the post-reform period. Although the quality control process is relatively complex, and data is sometimes inconsistent, water quality also does not appear to be a major problem. Under the contract, SODECI is required to meet the World Health Organization's (WHO's) water standards and according to SODECI close to 99% of its water met these standards in 1997 (World Bank, 1999). This is confirmed by a 1996 study, based on data collected from January 1993 to December 1995, showing that water quality in Abidjan basically meets these standards (Balla, 1996).[48]

Productivity. The steady improvement in productivity that was evident before 1988 continued after reform (see Figure 4). In addition, when the new contract was implemented, SODECI reduced its workforce from 1665 employees to 1349 employees, resulting in an additional one-time improvement. In part, this was due to the change in SODECI's responsibilities under the new contract—86 employees were laid off due to suspension of SODECI's involvement in rural water supply. However, presumably in response to the lower compensation under the new contract, 164 additional employees were laid off and 66 positions that were vacated by retirements, dismissals, resignations and deaths were not filled. By the end of 1996, there were 3.8 employees per thousand connections (1294 employees for 344,855 connections nationwide), which is very good by regional, or even international, standards. In comparison, SEEG and SONEG in Guinea had around seventeen employees per 1000 connections and SDE in Senegal had around six employees per 1000 connections in mid-1997.[49] SODECI has also continued to decrease the number of expatriate employees—from nineteen in 1987 to seven in 1996.

Commercial performance. Metering, which was close to 100% before reform, remained at this level following reform. In addition, as demonstrated by the continued low levels of UFW, the billing rate also remained high. Although the private collection rate was good before reform, the ratio of accounts receivable to total sales for the private sector improved after reform, falling from 7 months in 1987 to under 4 months by 1996 (see Figure 12). Indeed, SODECI reports that its collection rate from the private sector (i.e., amount collected divided by amount billed) was about 97-98% (SAUR, 1997). Reform improved SODECI's incentives to collect in two ways. First, before reform, SODECI's compensation was based upon the DE's projections of total sales, not on actual sales. After reform, SODECI's compensation was based directly upon collections. Second, by self-financing investment from the water tariff rather than through government borrowing and

[48] The equipment in some neighborhoods, including many of the poorest (e.g., Plateau, Adjamé, Anoukoua-Kouté, Riviera Nord), is less adequate.

[49] Outsourcing is marginal and has not changed significantly over the period studied. According to SODECI, it represents about 10% of turnover and is mostly related to services such as cleaning and security (Meeting with B.A. Ebah, 06/05/1998).

subsidies, system expansion started to depend directly upon SODECI's success with collecting. Since SODECI effectively controlled the *Fond de Développement de l'Eau* (FDE) this effect was magnified.

Sewerage. As in the past, the sewerage sector was not included in the 1988 sector reform. However, over this period, the World Bank did finance a large sewerage expansion project that connected 174,000 additional Abidjan inhabitants (World Bank, 1996). In addition, an ocean outfall pipe was constructed, which will mean that sewerage from the system will no longer be dumped into the lagoon.[50] When SODECI's management contract for operation and (limited) maintenance of the sewerage system expired in 1987, it was put out for tender. Although SODECI won the bid, bidding resulted in a 35% reduction in SODECI's compensation. When SODECI stopped passing the rental fee to the FNE in 1992, the government was unable to pay SODECI's management fee, which was paid from FNE resources. SODECI, however, continued to perform its responsibilities. Although the contract expired in 1997, the government was still negotiating a new lease contract for sector operations and maintenance with SODECI in mid-1999.

VI.2 The Effect of Reform on Coverage and Prices

System expansion. The number of connections in Abidjan increased from 105,806 to 179,202 between 1988 and 1996. Figure 9 shows an estimate of the connection rate assuming 13.5 people per connection.[51] As noted earlier, the slow expansion of the system, combined with the fast growth of the city, led to a decline in coverage in the period before reform. After the reform, this trend reversed and coverage improved. The improvement accelerated in the mid-1990s, following the devaluation of the CFA Franc and the subsequent recovery of the Ivoirian economy.

[50] However, waste from non-connected industrial plants and households might still end up in the lagoon.

[51] SODECI estimates that between 12 and 15 persons, on average, use each connection. Note that the pattern is similar assuming other numbers of people per connection, although the actual numbers.

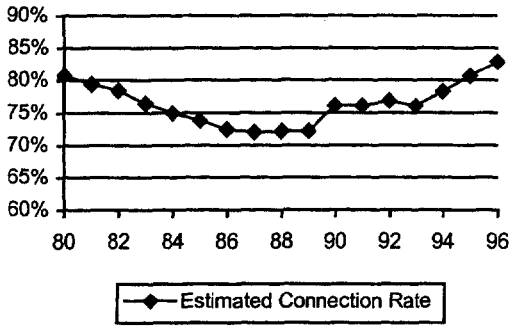

Figure 9: Estimated Connection Rate in Abidjan

Note: Assumes 13.5 people per connection (SODECI officials estimated between 12-15 people per connection).
Source: Connections (SODECI); Population (World Bank, 1998).

The increase in coverage occurred despite a significant decrease in investment, due to the shift to self-financing and the government's failure to pay its water bill. Indeed, while the Direction de l'Eau invested $40 million/year in the 1970s, SODECI spent only $7 million/year between 1988 and 1992 (World Bank, 1993). However, the reversal also reflects the fact that almost all investment between 1988 and 1998 was in the distribution network, primarily financing social connections for the low-income population. There was no significant investment in production for over ten years (e.g., no new boreholes were drilled) and, consequently, according to SODECI, the system was operating at over 90% of total capacity by 1998 (field interviews in 1997 and 1998). Since then, SODECI has used a loan from the CFD to finance the construction of new facilities in Abidjan (World Bank, 1999).

The faster increase in the number of connections might partly be because SODECI was more efficient than the *Direction de l'Eau* was. However, other explanatory factors related to the design of the contract might also explain this. First, SODECI has greater incentives to connect new customers, rather than invest in other facilities, because this has a direct effect on its revenues. Consequently, it has operated production facilities close to capacity. Second, under the contract, SODECI has to go through a competitive bid process for large investments (over CFAF 120,000), but can implement small investments (e.g., new connections) without any bidding. This gives SODECI, which received 18% of revenues from investment related activities in 1996 (SODECI 1996), an incentive to focus on small investments, such as new connections, as much as possible. Third, although the tariff system, under which small customers who consume little water pay lower tariffs than customers who consume more, might seem to discourage SODECI from connecting small customers, this does not seem to be a major problem. In large part, this is probably because SODECI's compensation remains about the same at all levels of consumption. Although the 'social tariff' is CFAF 184/m^3, while the 'industrial tariff' is CFAF 532/m^3, SODECI's remuneration is CFAF 144/m^3 for the 'social tariff' and only CFAF 198/m^3 for the 'industrial tariff'. In contrast, the government funds (the FNE and FDE) receive far

more revenue from the industrial tariff (CFAF 312/m^3 compared to CFAF 24/m^3 from the social tariff).[52] Finally, it appears that SODECI might have concentrated relatively more investment in Abidjan and less in secondary centers than the public agencies did before reform. Although the average growth of connections in Abidjan increased from 4.2% in 1980-88 to 6.6% in 1988-96, the average growth in secondary centers fell from 8.3% in 1980-88 to 5.5% in 1988-96. Since the marginal cost of water is lower in Abidjan than in secondary centers, directing investment towards the capital would make sense from a commercial standpoint.

Prices. As noted in the previous section, the re-negotiation of the concession contract in 1988 led to a significant reduction in tariff rates, especially for large users. The 'domestic' tariff was reduced by 20% and the 'industrial' tariff was reduced by 23% (see Table 1). Since then prices have continued to fall. In field interviews, most Ivoirian consumers seem to accept prices in the mid-1990s—an additional strong indication of the acceptance is that SODECI reported a private collection rate of 97-98% in 1997 (SAUR, 1997). In 1997, the average price of water was US $0.54/m^3 (CFA Fr 323.5), compared to pre-reform average price of US$0.85/m^3 (CFA Fr 296).[53]

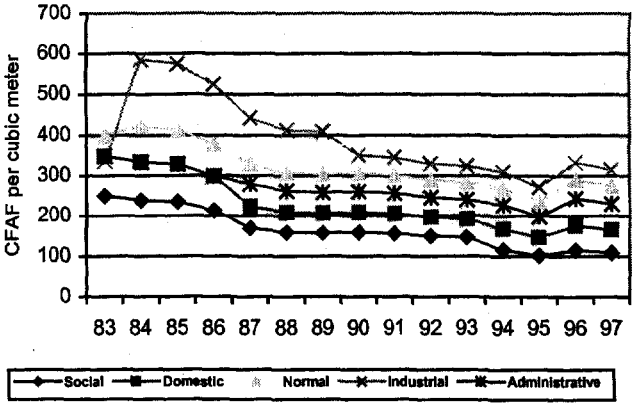

Figure 10: Tariff levels in Real 1990 CFAF Francs

The contract stipulates that prices should be adjusted every six months according to a fixed formula based on inflation, the cost of labor and certain inputs, and import duties and taxes, and renegotiated every five years. In practice, these procedures have not been followed (World Bank, 1999). Prices have not been adjusted every six months according to the formula and they were left

[52] VAT is CFAF 16/m^3 and CFAF 22/m^3 for the social and industrial tariffs respectively.

[53] Access charges for small consumers are also subsidized—there is no charge for connection pipes less than 15mm in diameter for private non-commercial connections. Low income consumers do have to pay CFA Fr 6,934 for installation of a meter, CFA FR 2,080 for registering and pay CFA FR 16,500 in advance for water consumption. In contrast, large consumers (with access pipes between 20 and 40mm in diameter) have to pay, on average, CFA Fr 90,000 for connection pipes and additional charges for meters and advances for future consumption. The additional charges vary from between CFA Fr 60,177 for pipes 20mm in diameter to 346,480 for pipes 40mm in diameter.

unchanged at the first five-year review (in 1993). There have been, however, several ad-hoc adjustments. In 1990, as a condition for the release of the second tranche of a World Bank loan, the industrial tariff was reduced from CFAF 412 to CFAF 350. In addition, since the devaluation of the CFA Franc significantly increased SODECI's costs for imported goods, a tariff increase was negotiated following the devaluation in December 1993 (see Table 1) Since it would have been difficult for political reasons to adjust prices the full 25% that would have been needed to fully compensate SODECI, the adjustment was only partial. However, after further negotiations and in return for a loan from the *Caisse Française de Développement* (CFD), the government agreed to an additional price increase in May 1996 (see Table 1).

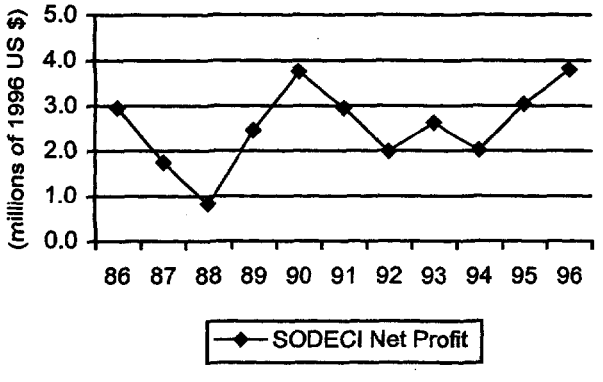

Figure 11: Net Profit of SODECI (millions of 1996 US$)

Despite the price increases, SODECI's profits, after an initial drop at the time of reform appear to have recovered (see Figure 11). At least, in part, SODECI has managed to cope with falling prices by reducing costs. Between 1987 and 1996, operating expenditures (expenditures on labor and intermediate inputs) fell from close to CFAF 17,668 million to CFAF 15,662 in 1990 prices. This occurred despite a 30% increase in water production, from 90 billion m^3 in 1987 to 118 billion m^3 in 1996. Although expenditures on intermediate inputs remained at about CFAF 12,300 million (in 1990 prices), labor expenses fell 36% from CFAF 5,329 million to CFAF 3,369 million (in 1990 prices).

VI.3 Challenges that Remain

Non-payment by the public sector. Although non-payment by the public sector became a problem before reform, public sector arrears continued to grow and, by 1994, they were equal to over five and a half years of public sector sales (see Figure 12). Although there was a marked improvement after 1994, this is primarily due to a loan that the *Caisse Française de Développement* gave the Ivoirian government to pay its water bill. One of the main reasons for the public sector's poor performance record is that SODECI is unable to cut off public sector entities for non-payment. Consequently, when public sector entities do not pay, SODECI can do little about it.

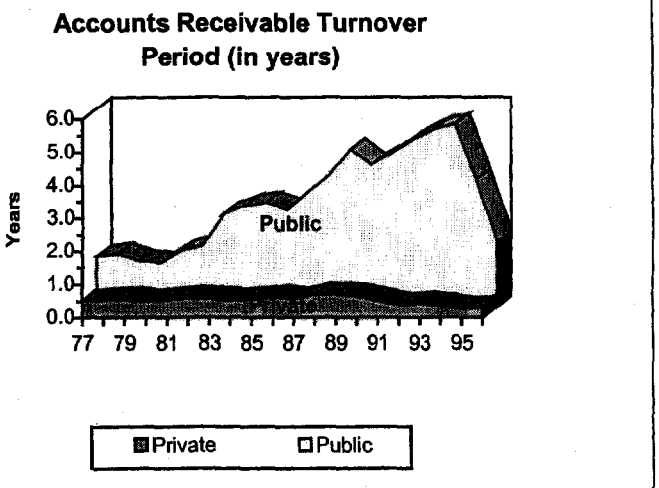

Figure 12: Public Sector Accounts Receivable Turnover Period (in years)

Source: SODECI.

Since the public sector accounts for about 25% of total revenues, non-payment by the public sector is a significant problem and has been a continuing source of tension between the partners to the contract. In addition to affecting SODECI, since SODECI was only obliged to transfer the 'rental fee' to the FNE and FDE for bills that were paid, non-payment also reduced the resources available for investment and debt service. By the end of 1991, public sector arrears had reached CFAF 23 billion ($73 million). In January 1992, SODECI applied to the Prime Minister's Office for, and was granted, a waiver from paying the 'rental fee' to the FNE. SODECI resumed payments in 1995, when the government started to repay its arrears to SODECI (see Figure 12). In other terms, SODECI received some protection from non-payment of their bills by governmental bureaus and public agencies, with the government transferring the burden to the agencies in charge of investment and debt service, leading to tension with the *Caisse Autonome d'Amortissement (CAA)*.

Sustainability of investment. Although the private operator managed to keep increasing connections, it did this by neglecting other types of investment. Consequently, production was hitting capacity limits by the end of 1997. It now seems unlikely that the rental fee will provide sufficient funds for investment and future investment will probably require financing from additional borrowing. The fiscal crisis has meant that the Government is unable, or unwilling, to finance system expansion (and has even delayed paying its own bills—see Figure 12). However, SODECI can not borrow to finance investment under the current contract. A special arrangement, reached between the Government and the *Caisse Française de Développement* (CFD) in 1996, allowed an "exception" to this general rule. Conditional on a price adjustment and the payment of overdue public sector bills, the CFD loaned the government CFAF 12 billion and provided an additional CFAF 4.2 billion loan to SODECI for investment. About half of the loan was for new production units and about half is for social connections. However, the loans will be serviced through the Fond de Développement de l'Eau, making the government

ultimately responsible for repayment. Consequently, although SODECI does not bear any risk, it will have direct access to the investment funds and will not have to compete for works contracts.

Cost plus price system. In practice, the decline in real tariffs does not appear to have had a large impact on SODECI's profits. Consequently, it seems possible that the contractual arrangement suffered from the usual bias of a cost-plus system (i.e., the operator had little incentive to reveal cost information to the regulator or to reduce costs). In theory, this should be mitigated by the fact that prices are set based upon expected costs, not actual costs. Since prices are supposed to be set for five-year periods, SODECI could keep any additional cost savings it implements over this period until the next five-year review. However, in practice, prices have not been adjusted according to the contract—renegotiations have been ad-hoc, major renegotiations have not occurred every five years, and the six-month adjustment formula has not been applied. Since the operator could lose cost savings at any point through ad-hoc adjustments (i.e., not on a five-year schedule), the private operator's incentives to cut costs have been reduced.

VII Lessons from a Stylized Case

In the previous section, we provided evidence that supports the view that the 1988 reform was largely successful. The strong performance of the sector was maintained and even improved in several important ways, despite the continuing economic crisis and the large increase in population. Given the difficult environment in Côte d'Ivoire during the 1980s and 1990s, the main question is why has this system been so successful? Is the contractual arrangement particularly well designed or is success due to institutional factors specific to Côte d'Ivoire? Our tentative answer is that the institutional endowment, with its long standing acceptance of private sector participation and the guarantees it provided to investors, has allowed a well-designed system to function. The good fit between stable institutional rules providing guarantees to the operator and a contract providing adequate incentives is likely the foundation of this success.

Despite this positive assessment, some problems with the initial contractual arrangement persisted after the reform. This report identifies at least five factors that have hampered success and that may threaten the sector's long-run performance, namely:

1. The separation of sewerage and water supply, and the failure to expand the former.
2. The ambiguous and constantly changing roles of different public agencies.
3. The public sector's failure to pay its water bill, which has threatened investment.
4. The contract, which mixes aspects of concessions and leases, allowing the private operator to perform most investment without competition or financial risk.

5. The government's failure to introduce competition in the sector and the effect that this has had on the capacity of public agencies to collect relevant information from the operator.

The first three points are mostly related to failures or problems in the institutional setting. The last two concern the design of the contract. In this section of the paper, we discuss these issues and suggest some ways to improve sector performance.

VII.1 Institutional Bugs

The institutional decision to separate water and sewerage has led to uneven subsector development. While 80% of households in Abidjan had access to safe drinking water by 1996, only about 35% of households had sewage connections, despite loans from international lenders. Although the aquifer, which is located at a depth of over 60 feet and is protected by a thick layer of clay, has not become polluted, the situation appears to be getting worse. Judging from the record in water, increased private sector participation would improve subsector development.

Regulation and monitoring of the private operator has been made more difficult by the unclear and constantly changing roles of different public agencies. Between 1987 and 1995, the *Direction de l'Eau* and BNEDT competed for responsibility over sector investment. Although the situation was clarified with the May 1995 Convention, which firmly established the leadership of the *Direction de l'Eau*, the simultaneous creation of the *Haut Conseil à l'Hydraulique* led to the emergence of a new, potentially competing, agency. Disputes over bureaucratic territory have made the private operator's position difficult and have slowed the decision-making process. Because of the resulting conflicts, and because of the importance and influence of SODECI and its main shareholder (SAUR), there is a strong incentive for the operator to go over these agencies directly to the President of the Republic. Moreover, conflict between the agencies has meant that the regulators have failed to develop coherent competencies and share information. This, in turn, has increased information asymmetries and hurt the quality of regulation.

A third problem, rooted in the institutional environment, is the government's failure to pay its water bill. This restricted funds at the time when the system was shifting towards self-financing investment and led SODECI to withhold funds for debt service. Although a loan from the Caisse Française de Développement reduced this problem significantly in 1996, unless public sector discipline improves, it could easily occur again. Allowing the private operator to cut off public sector agencies that fail to pay their bills is certainly useful. However, private operators, which remain heavily dependent upon the government, have often been unwilling to do this. For example, in Guinea, the private operator has not cut off any central government agencies for non-payment even though the contract

explicitly allows it to do so (Ménard and Clarke, 2000). In a country such as Côte d'Ivoire, where recent price adjustments have been made through a process of negotiation, rather than by following strict formulas, this could be a potential problem.

Several methods that have been tried in other sub-sectors might encourage greater discipline. First, international donors can provide, under some circumstances, guarantees for government payment of utility bills. This essentially shifts the risk of non-payment onto international donors, who have greater leverage over the government. Second, some part of export revenues might be tied to government payment. These methods are not, however, perfect. A private operator might be unwilling to call a guarantee for much the same reasons that it is often unwilling to cut water off to a government agency. In the end, the most important thing is for the government to recognize the effect that non-payment has on sector development and to act accordingly. This raises the difficult issue of building government's credibility with regard to guaranteeing full property rights, including the right for private operator to be paid.

VII.2 Contractual Failures: Lease versus Concession

The fourth problem is the fundamental ambiguity of a contract that mixes characteristics of a lease and a concession. Since the private operator does not bear any investment-related risk, the arrangement is a lease in the terminology of this project (see Ménard and Shirley, 2000). However, despite not bearing any investment-related risk, SODECI plans and implements most investment. This has allowed SODECI to virtually eliminate any competition over investment projects, creating opportunities for SODECI to act opportunistically and further aggravating information asymmetries.

As well as affecting competition over investment, the contract has also had a significant impact on the quantity of investment. Under the 1988 arrangement, SODECI was not able to borrow to finance investment and was not responsible for debt service. Since the fiscal crisis and the large increase in government debt reduced the government's willingness to borrow, the only funds available for investment were those generated through water tariffs. Even if the government had continued to pay its water bill and the crisis had not affected industrial consumption, it would have been difficult to finance all investment needs in this way. Although SODECI managed to increase both the number of connections and the coverage rate in Abidjan, investment in productive capacity was ignored. Although recent loans from the CFD have recently allowed additional investment in production facilities, this is likely to continue to be a problem in the future.

The Government's continuing financial difficulties make it unclear whether the necessary financial resources should be raised through the Government, by borrowing from abroad, or by allowing (and encouraging) SODECI to obtain direct access to financial

markets. The final solution, which would pass investment risk to SODECI, would result in the contract becoming a true concession. As noted in the previous section, a recent loan by the *Caisse Française de Développement* (CFD) is a step in this direction, although it partially protects SODECI against risks. Considering the stability of the Ivoirian regime and the long tradition of private management of utilities, particularly in the water system, and the country's strong rating by private risk assessment agencies, passage to a full concession may be both desirable and feasible. But what are the respective merits and limits of concession and lease in an environment like that of Cote d'Ivoire?

The fundamental advantage of a **concession** is that it makes the firm fully responsible for investment, management and debt for the duration of the contract. Since profits depend upon its capacity to collect bills, the operator has a strong incentive to extend the network and to meter and bill users. However, unless certain conditions are fulfilled, concessions can be inefficient. First, the contract should be awarded through competitive tender. However, the uncertainties associated with running a water utility in a developing country mean that this is not always easy to do.[54] Further, competition is likely to be even less effective for contract renewals, since the incumbent has a significant informational advantage. In Africa, because of the small number of firms that have been actively involved in the urban water sector, it is even more difficult to ensure that bidding is competitive. Second, the contractor's obligations (e.g., investment and network development) should be well specified, and easy to implement and monitor. Again, this can be difficult in developing countries, since many factors that affect the optimal evolution of the system are unpredictable (e.g., unplanned urban developments). Third, because water systems are close to a natural monopoly, there is a risk that the operator would continuously pressure for renegotiations, once the contract has been allocated. Hence, dispute resolution mechanisms must be well defined and efficient, which requires especially sophisticated and credible institutions. Fourth, the regulator monitoring the concession needs to have access to, and the technical ability to assess, relevant information (e.g., on costs and the maintenance of the system). Therefore, the contract needs to have adequate information revealing schemes and the regulator needs to have the technical and managerial skills to assess this information. Fifth, the firm might overuse equipment and under-invest in maintenance, particularly towards the end of the contract, if there is a risk that it will not have the contract in the next period. The only way to avoid this bias is to have a credible and efficient regulator, with sufficient enforcement power. This requires highly qualified, and independent, civil servants. Finally, the most important problem is that large fixed investments, which can not be re-deployed to other uses, are required. These investments are risky in countries with limited capital markets and unstable

[54] See Menard and Clarke (2000) for an example of this.

institutional environments. Although, as discussed earlier, Côte d'Ivoire has stronger institutions than many other developing countries, many observers believed that the risks were still too high to implement a full concession, especially since the contract includes systems in secondary centers.

The main advantage of a lease is that it is more attractive to private operators, who might otherwise be reluctant to get involved in risky environments. If the contract is well designed, (i.e., if there are adequate incentives to develop the water system and to perform efficiently), private operators might be able to significantly improve the management of the system. Adequate incentive schemes should base the operator's revenues on bills collected, and should provide the operator with motivation to reduce unaccounted for water (UFW) and to extend the network. If the firm can capture part of the benefits of cost reduction, the contract might also encourage them to reduce costs. This is the solution adopted in Abidjan and it surely explains part of the success of the contract.

However, there are also problems with lease contracts. First, since the operator is not responsible for investment, the incentive to overuse physical assets is particularly high. Second, because firms are not responsible for, nor involved in, the management of the debt, there is a bias towards investment. This bias is aggravated by the affiliation that many large water companies have with construction companies (e.g., SAUR is a subsidiary of the construction group, BOUYGUES). Third, unless the contract is very specific, since the operator's income is based on bills collected, there is a strong incentive for the leasing company to develop the network only in the most profitable areas. If there are public health externalities or equity issues, leases might result in under-investment, especially in poor areas. Requiring the operator to charge the same price throughout the country or charge poor residents a lower 'social tariff' will magnify this risk. Fourth, for the reasons mentioned above, there is a risk that competition from bidding will be very limited, especially for contract renewals.

Several factors alleviate the difficulties listed for both concession and lease contracts. First, since water systems rely on technologies that are well established, inputs are easily identifiable and costs are easier to assess. Therefore, a relatively competent regulator can estimate the validity of claims made by the operator more easily than in other infrastructure sectors. For example, in Côte d'Ivoire, the experienced engineers at BNEDT could determine whether the operator needed to change a pump and, based upon international prices, how much they should charge. Second, since there are very few operators on the international market for water supply services, and they are fierce competitors, there are strong reputation effects. If the operator wishes to expand, and to gain other contracts elsewhere, they would want to avoid problems with existing contracts.

The last problem in Côte d'Ivoire, as in many other countries, is the failure to introduce competition into the sector. There was no bidding for contract renewal in 1988. Moreover, bidding has been eliminated for most investment. Although the macroeconomic problems meant that most new investment was for social connections, allowing the operator almost exclusive access to the *Fonds de Développement de l'Eau* is likely to increase costs in favor of the operator.[55] Attempting to increase competition for investment could be accomplished by splitting the water system into autonomous subsystems for the different cities and allow bidding over these investment contracts.

In addition to foregoing the likely efficiency gains, the lack of competition also makes it difficult to assess whether water could be provided at lower cost. Although SODECI appears to perform well by regional standards, the price of water is high compared to the prices observed in Latin America and Asia (see footnote 1). Although international comparisons are difficult due to both institutional and physical differences between countries, this suggests gains might be possible. Because SODECI has a monopoly on urban water distribution in Côte d'Ivoire, there are no other companies to compare its performance within Côte d'Ivoire. Splitting the contract into several separate contracts for different cities would help to develop the bidding process and would allow yardstick competition.

Yardstick competition allows the operator to cut its own costs, without affecting the revenues that it receives (i.e., the regulator bases the price that the operator charges on the performance of *other* utilities). Although this is an attractive idea, it has proven difficult to implement even in developed countries (see Clarke, Cowan and Zuluaga, 2000). For example, in Côte d'Ivoire, Abidjan is very different from most other major cities. It is far larger than any other city, gets its water from an aquifer rather than a dammed river, and receives more rain than cities in the interior of the country. Consequently, most estimates of the long-run marginal cost of water are far lower for Abidjan than for smaller secondary systems. It would be difficult, therefore, to split the contract and allow yardstick competition, without abandoning the government's commitment to having the same tariffs throughout the country.

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[55] According to our interviews, the standard procedures in mid-1998 were the following. For new investments (extensions etc.), SODECI prepares plans that are thereafter submitted to the *Direction de l'Eau.* Once approved, these plans are either realized by SODECI (if the amount is less than 120 million CFA, which has been systematically the case recently) or through bidding (if more than 120 million CFA), under the supervision of the BNETD. For maintenance of the system and of related equipment (i.e., replacing a pump) the *Direction de l'Eau* assesses whether it is justified and it approves (or rejects) SODECI's proposal. However, this is often an ex-post formality since there are often emergencies. Finally, the management of *branchements sociaux* is largely left to SODECI, although the *Direction de l'Eau* decides the criteria for qualifying for the subsidized connections. The *Direction de l'Eau* checks that connections have actually been installed and that the beneficiaries meet the criteria, ex-post.

Rather than introducing yardstick competition, another solution would be to set prices based on a **price cap** system. The system adopted in 1988 was a simple cost-plus system, where SODECI negotiates tariff levels with the government every five years.[56] Prices are determined based upon SODECI's costs and the amount necessary to cover sector debt and to pay for required investment. Since the cost plus system guarantees profitability, the private operator has little incentive to reduce costs. Moreover, cost-plus systems raise well-known problems of information revealing scheme. There is, however, some incentive provided by the regulator's oversight and the operator's desire to maintain its long-term relationship with the government.

In contrast, under a price cap, since the operator can keep any cost-savings (for a fixed period), it has stronger incentives to continuously improve its competitiveness. However, the system could be politically sensitive, since the regulator is not empowered to cut prices during the period that the agreed price is in effect, even if the operator is making large profits. However, if the regulator does cut prices when the operator makes profits, then the operator has less incentive to cut costs (i.e., it becomes a cost plus system). A price cap might also encourage the operator to develop the network only for the more profitable sections of Abidjan and to avoid developing systems in poorer areas and in secondary cities, since this would keep costs low. Although the contract might try to correct this in other ways (e.g., specifying the number of new connections), this will increase complexity and transactions costs. Further, the government's failure to follow the tariff adjustment procedures specified in the current contract suggests that a change to a price-cap system might not be credible, especially if the government suspected that SODECI was making high profits.

To conclude our discussion, there is no optimal contract; there are contracts that fit more or less with the institutional endowments. In the case of Abidjan, the lease contract with significant responsibilities for the operator with regard to the choice of investments has worked well. On the other hand, there are many indications suggesting that the operator, benefiting from a favorable environment with the country's strong risk rating by private agencies, should assume more financial risk. Similarly, the high price of water in Abidjan suggests that there is room for gains; the cost-plus system should be revised accordingly, in order to provide the operator more incentive to reduce both prices and costs.

[56] Negotiations can also occur at other times in extraordinary circumstances (e.g., the devaluation of the CFA Franc).

VIII Conclusion

This case substantiates two important hypotheses. First, in general, in the absence of a change in the government's support base or a sector-specific crisis, a macroeconomic crisis will not make substantial changes in a specific sector *desirable*. The modest 1988 reform was motivated by a major economic crisis, which reduced the resources available for investment. However, the continued strong performance of private operator and the absence of a significant sector specific crisis meant that the reform resulted in minor adjustments to the existing contract to improve specific aspects of sector performance, rather than radical change. The increased responsibility given to the private operator following reform reflects that the problems resulting from the crisis were primarily concentrated in the public sector entities involved in the sector. Second, the case study illustrates the importance of the long-run stability and credibility of the government with respect to the contract and the guarantees of associated rights. Continuity of these commitments made continued private sector participation *sustainable*.

The reform has, in general, been successful, especially when sector performance is compared to the performance of systems in other cities in the region. Coverage has been maintained at a high level despite rapid population growth, water and service quality have been very good and prices have declined in real terms. Although the success is partly due to specific characteristics of the contract and to private sector participation in the sector, other cities in developing countries have adopted similar contracts, some with considerably less success.[57]

As noted in World Bank (1999, p.30) to a large degree, SODECI and the government's good relations have been based upon using negotiation and flexibility to achieve outcomes that are acceptable to both parties rather than on specific contract provisions. Indeed, some contract provisions have been ignored (e.g., the automatic six-monthly adjustment of tariffs based upon a fixed formula). At a general level, success in Côte d'Ivoire has been due to the government's consistent support for private sector participation in the sector and the institutions that have guaranteed the property rights of the operator. More specifically, the existence of strong micro-institutions with sufficient human capital has allowed the government to supervise the private operator and monitor the contractual arrangement well, at least by regional standards.

[57] For example, see Ménard and Clarke (2000), that discusses a similar lease contract in Guinea. Although the lease contract in Guinea does differ in some ways from the contract in Côte d'Ivoire, in both positive and negative ways, it has proven to be considerably less successful. In large part, this seems to be to difference in institutional endowments between the two countries.

Nevertheless, our paper has identified some serious flaws in the arrangement. The quality of information available on the private operator and investment—a well-known bias in cost-plus systems—has been a consistent problem. Moreover, the contractual arrangement adopted in 1988 gave the operator, SODECI, considerable influence over investment decisions, without requiring it to bear related risks. Another problem is that, under the new arrangement, all aspects of competition were seriously weakened. The concession was not open to competitive bidding at the time of reform and SODECI has managed to almost eliminate bidding for new investment. Since bidding is one way to reduce information asymmetries, and given that the information asymmetries between the private operator and the regulating agency are very large, this has likely slowed sector development. Other aspects of the contractual arrangement have also had a negative impact on the information available to the public sector agencies. Unclear and overlapping responsibilities for the two main public agencies involved in the sector, which appear to have been recently resolved, led to an extended power struggle. Consequently, the agencies failed to develop the relevant skills required to monitor the contract and failed to fully coordinate their decisions and share information. This resulted in an awkward situation for the private operator and slowed sector development.

In summary, sector performance in Abidjan has been impressive, due in no small part to the strong performance of SODECI. This has been supported by the government's commitment to private sector participation and an institutional framework that protects the private operator. However, the resolution of some remaining problems could further improve sector performance and guarantee these gains into the twenty-first century.

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